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TABULATIONS OF DATA COMPILED FROM A
SURVEY OF DISCHARGES FROM COMBINED
SEWERS AND SEPARATE STORM SEWERS AT
DETROIT AND ANN ARBOR, MICHIGAN

Public Health Service
Grosse Ile, Michigan

August 1964

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TABULATIONS OF DATA ✓
COMPILED FROM
A SURVEY OF DISCHARGES
FROM COMBINED SEWERS
AND SEPARATE STORM SEWERS
AT DETROIT AND ANN ARBOR, MICHIGAN

CONDUCTED BY
MICHIGAN DEPARTMENT OF HEALTH
MICHIGAN WATER RESOURCES COMMISSION
AND THE
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
DETROIT RIVER-LAKE ERIE PROJECT ✓

IN COOPERATION WITH

CITY OF DETROIT
CITY OF ANN ARBOR

MAY 1963 TO AUGUST 1964

UNITED STATES GOVERNMENT

Memorandum

LWB rec'd copy
PUBLIC HEALTH SERVICE
U.S. NAVAL AIR STATION
GROSSE ILE, MICHIGAN
21P-43134
JG

TO : See below.

DATE: June 25, 1965

FROM : George L. Harlow, Project Director
Detroit River-Lake Erie Project

SUBJECT: Report on combined sewers and separate storm sewers at Detroit
and Ann Arbor, Michigan.

Enclosed for your information and use is a report titled "Tabulations of Data Compiled from a Survey of Discharges from Combined Sewers and Separate Storm Sewers at Detroit and Ann Arbor, Michigan", prepared jointly by the Detroit River-Lake Erie Project and Michigan agencies.

The Report represents a compilation of the information obtained in the studies of the separate storm sewer system of the City of Ann Arbor, and the combined storm and sanitary sewers of the City of Detroit. The period covered extends from May, 1965 to August, 1964. The study is continuing and will provide results on other water quality measurements besides coliform bacteria which will be published periodically.

Inserted as an adjunct to the document are the summary statements which are solely the consensus of the staff of the Detroit River-Lake Erie Project.

George L. Harlow
George L. Harlow

Enclosure

Project Directors
Regional Program Directors
Directors, Water Quality Laboratories
SEC Headquarters

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JUN 28 1965

WS & PC

1. Total coliform, fecal coliform, and fecal streptococcus densities in the overflow from combined sewers many times approached values found in raw sewage. Coliform counts of over 100,000,000 per 100 ml were found during summer months.
2. Bacterial densities in the combined overflows varied greatly with the season or time of the year. The highest densities were found during warmer weather and lowest results in the winter.
3. Total coliform densities in the separate system at Ann Arbor regularly exceeded 1,000,000 per 100 ml. Average total coliform densities in the overflows from the Detroit combined system were approximately 10 times higher than those in Ann Arbor's separate system. Fecal coliform densities in the combined sewer effluent were found to be approximately 30 times greater than similar values in the separate system, while comparable fecal streptococcus levels were at least twice as high.
4. In the Detroit area rainfall sufficient to cause overflows from all combined sewers (0.3 inch) can be expected to occur approximately 33 days each year. Rainfall sufficient to cause overflows from certain parts of the system (0.2 inch) can be expected to occur about 45 days each year.
5. Although the average duration of overflow from combined sewers was found to be 8.2 hours, discharges have occurred for continuous periods in excess of 24 hours. Two such overflows occurred during the month of August 1964.
6. Suspended solids concentration in the discharge from the separate storm installation at Ann Arbor was higher than in the combined overflows at Detroit.
7. Phenol, BOD, phosphate, ammonia, and organic nitrogen concentrations were two to five times higher in the combined overflow than in separate storm discharge.
8. Bacteriological results from the combined installations showed a slight tendency for higher values during the first sample but thereafter were relatively constant throughout the duration of the overflow.
9. Bacteriological results at the Ann Arbor separate system were also comparatively constant during a storm, always remaining within one order of magnitude. Small changes in quality and flow were more noticeable at this installation, however.
10. Calendar year 1963 was the driest on record for the City of Detroit according to rainfall records of the U.S. Weather Bureau. Even during this year, the Conners Creek pumping station was observed to overflow 12 times during a 6-month period in 1963. During the first year of operation of the automatic sampler, the Conners Creek installation overflowed and collected samples 23 separate times. Both figures exclude the period of raw sewage bypass from this station by the City of Detroit.

11. The volume of overflow at the Detroit installation during the survey varied from 40 million gallons to 509 million gallons. The greatest volume was observed during the overflow of longest duration. This volume, which originates from only 25 percent of the City of Detroit, is approximately the same as the daily discharge of partially treated sewage from all sewage treatment plants into the Detroit River.

12. Volume figures in the joint report indicate a discharge into the Detroit River of $4\frac{1}{4}$ billion gallons from the combined sewers serving the Connor system during the first year of operation of the sampling stations.

13. Overflow from the combined sewers occurred 3-4% of the time during the survey period. Rate of discharge per hour from the combined sewers varies with the intensity of the storm, making an exact ratio of sewage from the Connors gravity system to the discharge to the Detroit River impossible. Within the limits observed during the study, 50-80% of the raw sewage collected is spilled over into the River during the overflow. Thus approximately 2% of the total raw sewage contributed to the Detroit area plants reaches the Detroit River each year. This is over 5 billion gallons of raw sewage flowing into the River each year. Furthermore, this is a conservative estimate, since the Connor system is designed for more storage capacity than many other combined sewers in the Detroit and down-river collection systems.

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DESCRIPTION OF FACILITIES AND SURVEY PROCEDURES

This study was prompted by the need to secure more data on the quality and quantity of mixtures of wastewater and storm water discharged from combined sewers in the Detroit area under varying storm conditions. Following several meetings with officials of the City of Detroit it was determined that the Conners Creek gravity sewer system could be separated from the other sewer systems in the City and that sampling equipment could be satisfactorily installed. To determine the quality of storm water discharged from a separate storm sewer system, the Allen Creek Drain in the City of Ann Arbor was selected as the system to be studied.

The Conners Creek District is located in the northeast part of the City of Detroit and has an area of approximately 22,000 acres. The lands are used in typical urban fashion with commercial, industrial and residential development existing in the area. The northern portion of the district is primarily residential and commercial and the southern portion is primarily heavy industrial. The system also serves as an outlet for the dry weather flow from the Southeast Oakland County Sewage Disposal System.

The Conner System shown on Figure 1 has an outlet into the Detroit River at Conners Creek from the Conner sewer and another at Leib Street from the Conant-Mt. Elliott sewer. The dry weather flow is intercepted into the Detroit River interceptor located in Jefferson Avenue at Conner and Leib. During periods of surface run-off, the water is stored in the Conner sewer until the level slightly exceeds the water elevation in the Detroit River. At this time the backwater gates open and mixtures of wastewater and storm water are discharged into Conners Creek. At Leib

when the liquid reaches elevation 96.20 the mixtures of wastewater and storm water overflow into the Detroit River.

The Allen Creek Drain, shown in Figure 2, is an enclosed system of separate storm sewers serving approximately 3800 acres primarily within the City of Ann Arbor. The area is largely developed as a residential and commercial community although there is some light industry and a small portion of the University of Michigan campus in the district.

The Detroit Metropolitan Rain Gauge Network supplemented by one additional gauge provided the records for determining rainfall on the Conner District. One rain gauge was installed and provided the record of rainfall in the Allen Creek Drain District.

Similar sampling installations were made near the outlets of the Conner and Conant-Mt. Elliott sewers in Detroit, and the Allen Creek Drain at Ann Arbor. At Detroit the sampling pumps were activated when mixtures of sewage and storm water started to overflow to the Detroit River. At Ann Arbor the sampling pump was set to start when the water in the drain reached a level of two feet in depth at the outlet. It was necessary to have the pump submerged before starting and this required a water depth of two feet. The pumps discharged liquid to an automatic sampler as shown in Figure 3. For the first ninety seconds all wastewater was discharged to waste to flush out the line and then the first sample was collected. Following this a portion of the discharge from the pump was collected in individual sample bottles at intervals varying from 5 minutes to one hour throughout the period of overflow. The collected samples were taken to the laboratory at the Detroit River-Lake Erie

Project within 24 hours of the time of collection and analyzed.

All data collected is included and consists of 332 samples at Leib
355 samples at Conner and 116 samples at Ann Arbor. Samples were analyzed
for coliforms, fecal coliforms and fecal strep. Some of the samples
were composited and analyzed for ammonia nitrogen, phosphates, organic
nitrogen, phenols and suspended solids.

FIGURE 1

CONNERS CREEK SEWER SYSTEM CITY OF DETROIT

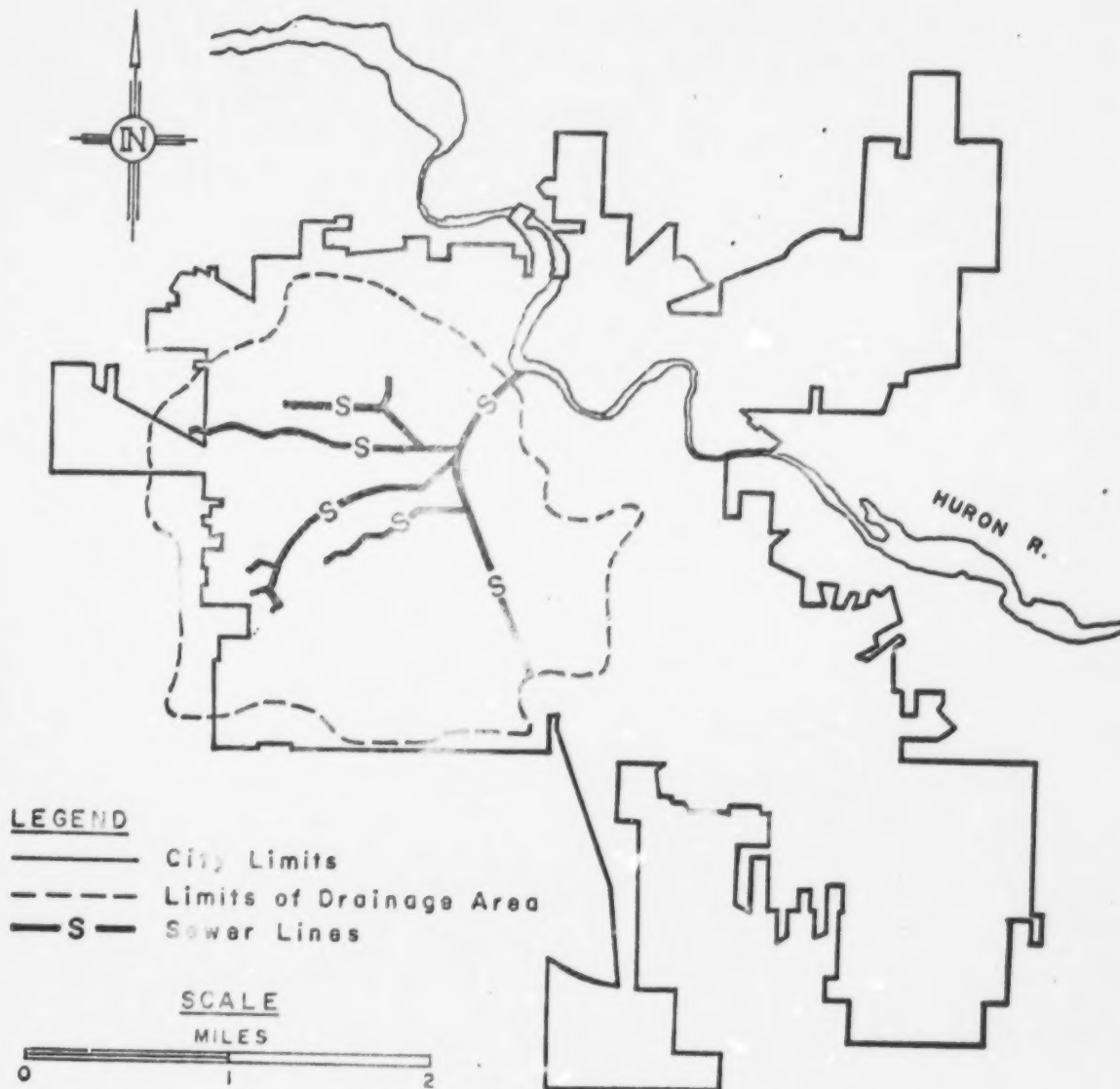


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FIGURE 2

ALLEN CREEK DRAIN SYSTEM

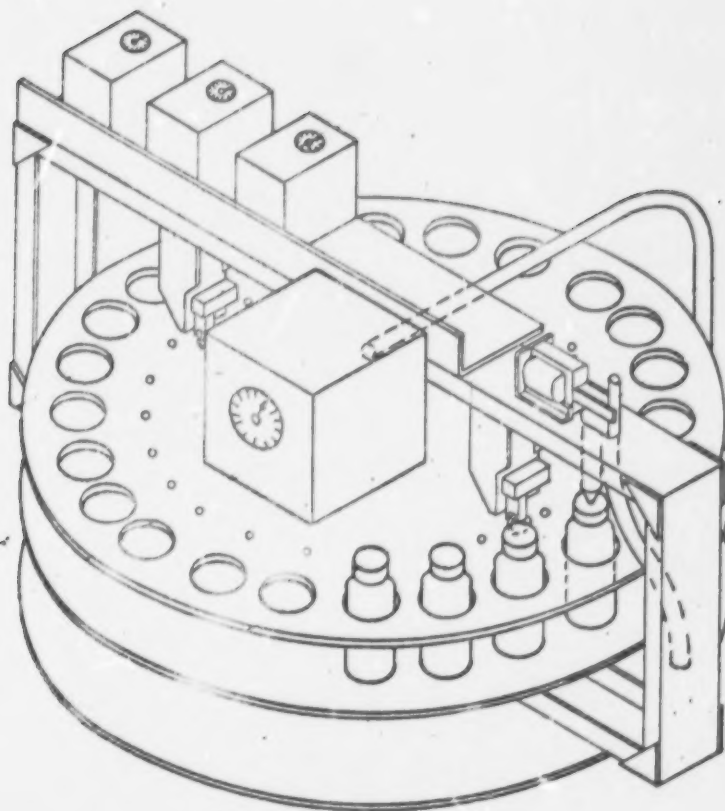
ANN ARBOR



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**AUTOMATIC SAMPLER USED IN
STORM WATER OVERFLOW STUDY
DETROIT RIVER-LAKE ERIE PROJECT**

FIGURE 3



PREPARED BY PUBLIC HEALTH SERVICE

RAINFALL

The rainfall in the Allen Creek District was secured from the single recording gauge located within the District.

The rainfall records from seven separate gauges in the Conner District were used to calculate the rainfall. The rain gauges used are all within the Detroit Metropolitan rain gauge network and are shown on the map which follows:

<u>Station No.</u>	<u>Station Name</u>	<u>Location of Gauge</u>
W-13	Detroit City Airport	Conner Ave N of Gratiot
W-15	Detroit City - Conners	12244 East Jefferson
W-17	Detroit City	
	Northwest Incinerator	7747 Buena Vista at Turner
W-18	Detroit City	
	Northeast Station	Near Hoover & 8 Mile Road
W-25	Detroit City	
	Res of G. Smart	19954 Appoline
W-28	Detroit City	
	Res of R. Matz	.7 mile SE jct 8 Mile Rd & Gratiot
W-30	Detroit City	
	Res. of C. Reid	.7 mile SSE on State Fair from jct State Fair & Dequindre Rds

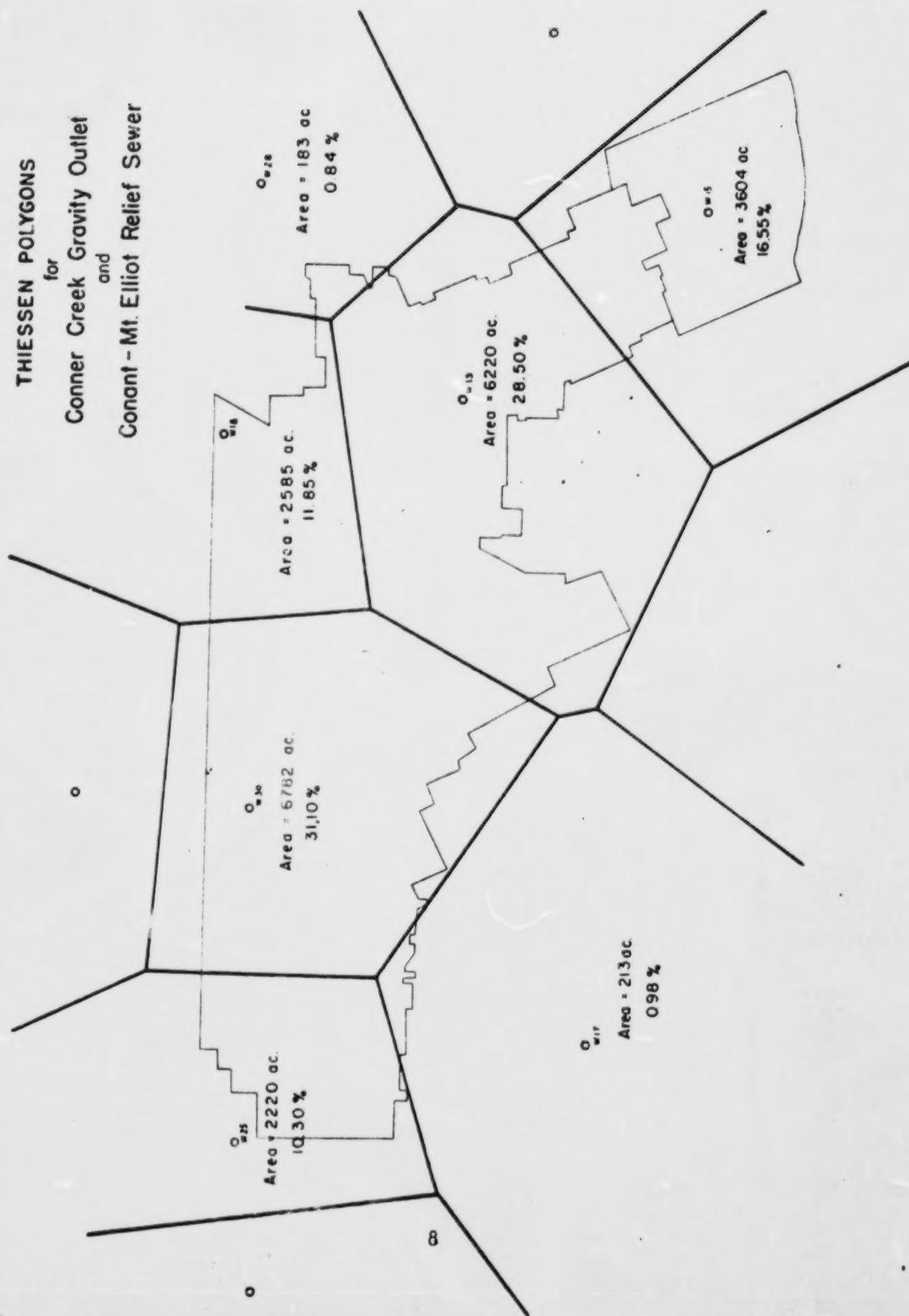
The rainfall on the entire basin was determined by the use of Thiessen polygons. In the Thiessen method, the weight of each station is proportional to its area of influence, which is determined by plotting perpendicular bisectors to the lines joining adjacent stations and measuring the basin area falling within the resulting polygon.

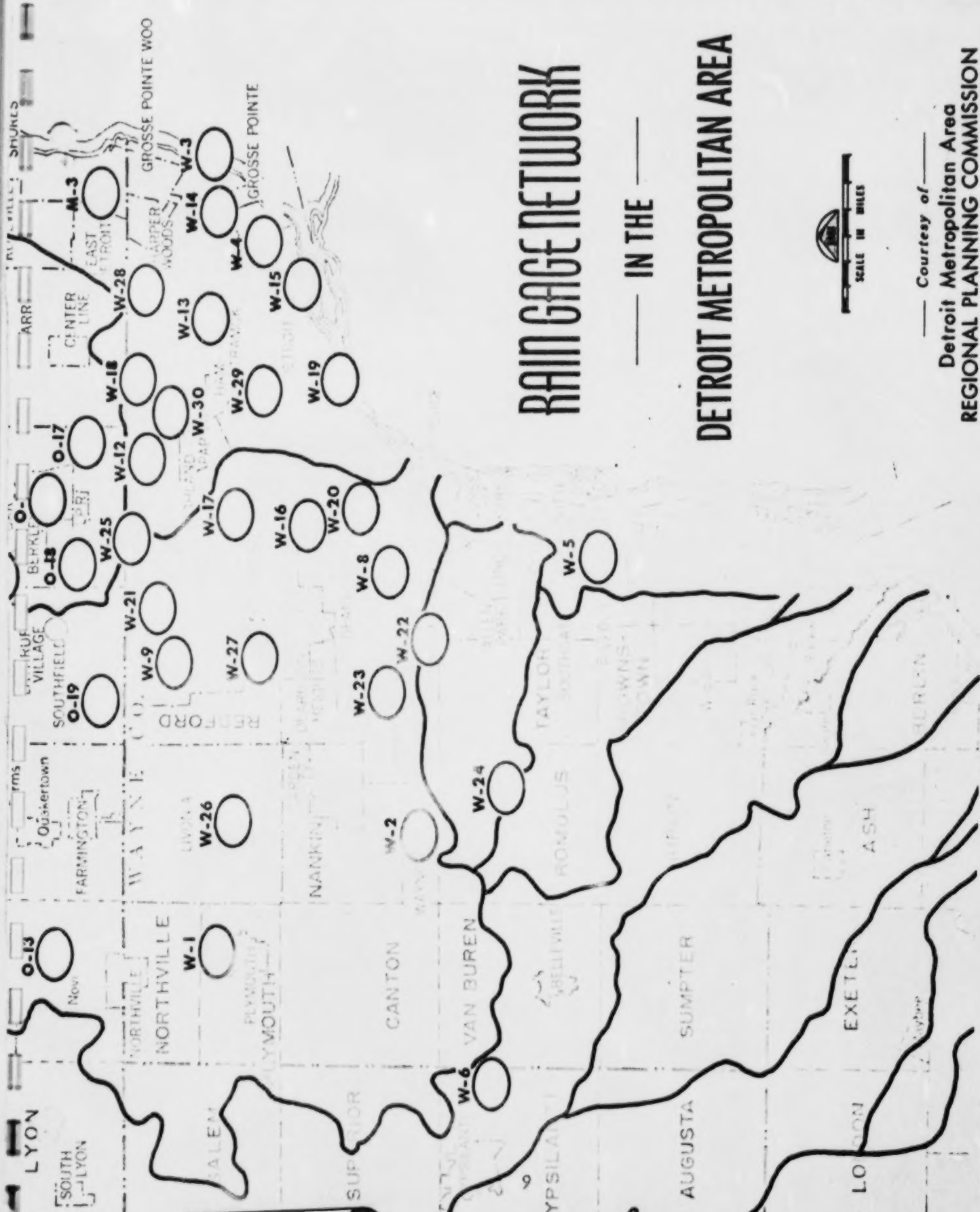
W-17 and W-30 are seasonal rain gauges and for the periods when records are not available the W-17 rainfall is assumed the same as W-25 and W-30 is assumed the same as W-13. These are the nearest gauges and a comparison of values during a period when both records are available show a great similiarity between these stations.

The stations and the per cent of area contributing for the basin are as follows:

W-13	28.50%	6220 acres
W-15	16.55%	3604 acres
W-17	0.98%	213 acres
W-18	11.85%	2585 acres
W-25	10.30%	2220 acres
W-28	0.84%	183 acres
W-30	31.10%	6782 acres

THIESSEN POLYGONS
for
Conner Creek Gravity Outlet
and
Conant - Mt. Elliot Relief Sewer





RAIN GAGE NETWORK

— IN THE —

DETROIT METROPOLITAN AREA



— Courtesy of —
 Detroit Metropolitan Area
 REGIONAL PLANNING COMMISSION

DETERMINATION OF AVAILABLE STORAGE

1. Computation of total capacity of Conner system to Detroit River elevation of 95.0

Outlet Section	1050 ft. 2 barrels 22'-11" x 17'-6"
River elevation	95.0
Ave. invert elev.	<u>81.57</u>
	13.43 ft.

$$\text{Volume} = (13.43) (2') (22.92) (1050') = \underline{646,000 \text{ ft.}^3}$$

Section One	7700 ft. 3 barrels 15'-9" x 17'-6"
River elevation	95.00
Ave. invert elev.	<u>83.10</u>
	11.90 ft.

$$\text{Volume} = (11.90') (3') (15.75') (7700') = 4,330,000 \text{ ft.}^3$$

Section Two 7000 ft. 2 barrels 12' x 17'-6"

River elevation	95.00
Ave. invert elev.	<u>84.45</u>
	10.55 ft.

$$\text{Volume} = (10.55' \times 24' \times 7000' \times \frac{1}{2}) = 886,200 \text{ ft.}^3$$

Total storage to river elevation 95.00 in the Conner Sewer

$$\begin{array}{r} 4,330,000 \text{ ft.}^3 \\ 646,000 \text{ ft.} \\ \underline{886,200 \text{ ft.}} \\ 5,862,200 \text{ ft.}^3 \end{array}$$

2. Computation of total capacity of Conant-Mt. Elliott system to river elevation of 95.00

Same procedure as for Connors

$$\text{Storage} = 184,067 \text{ ft.}^3$$

- [illegible]

4. Assume 7' of sludge in outside 2 barrels of 3 barrel sewer of Section #1

$$\text{Sludge} = (7') (31.5') (7700') = 1,697,150 \text{ ft}^3$$

- ### 5. Net Total Storage

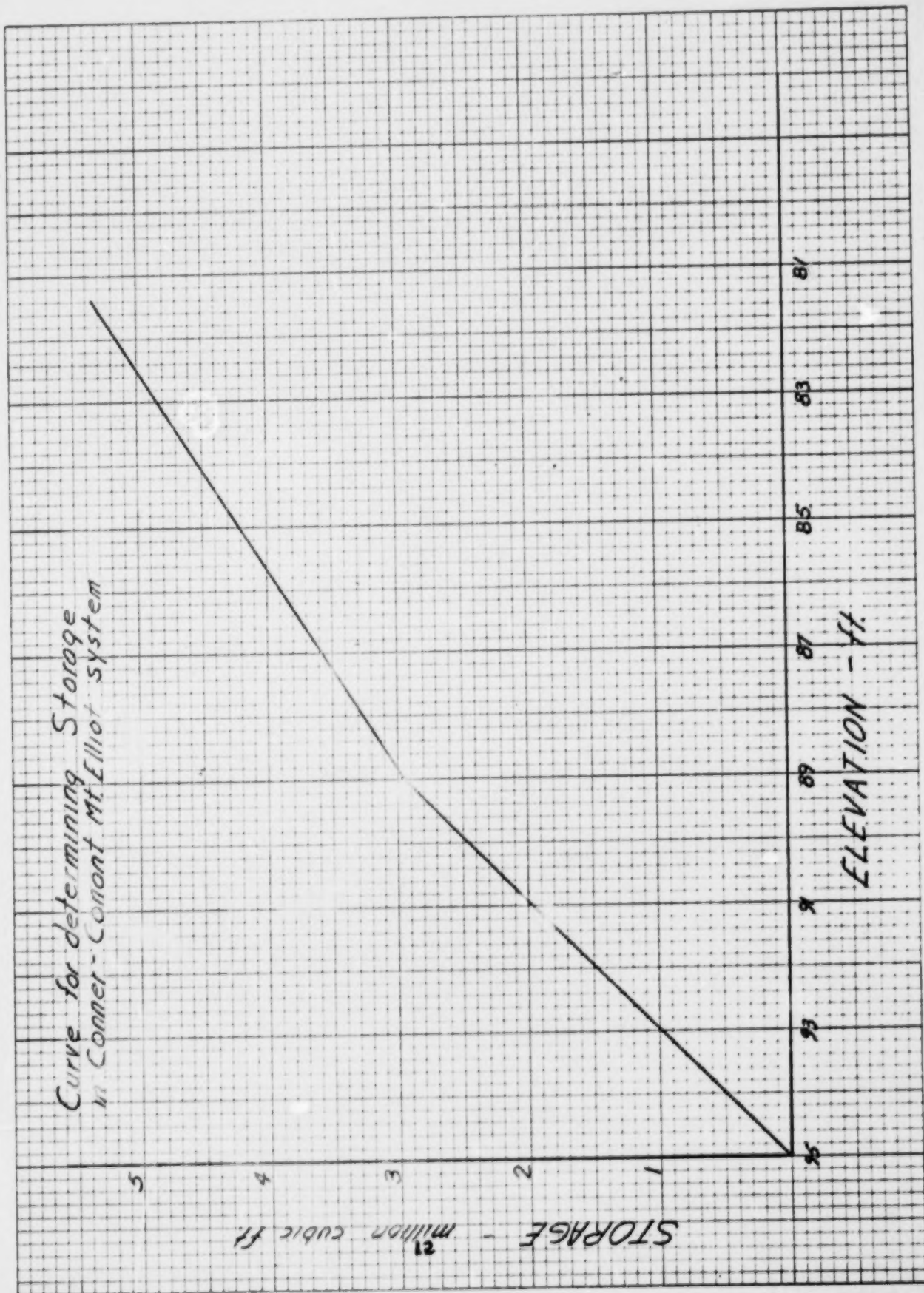
$$\begin{array}{r} 6,046,267 \text{ ft.}^3 \text{ total storage} \\ - 1,697,150 \text{ ft.}^3 \text{ sludge} \\ \hline 5,349,117 \text{ ft.}^3 \end{array}$$

The following graph was developed to determine the storage available at any time if both the elevation of the Detroit River and water surface in the Conner system are known. The maximum calculated storage value of 184,067 cubic feet was used for the Conant-Mt. Elliottsewer in all computations.

The following procedure was used to obtain available storage in the system prior to any storm.

1. Obtain the water level of the Conner system from the Stevens recorder chart of the recorder installed at the outlet section of the system.
2. Determine the storage at this elevation which is the storage which would be available at a Detroit River elevation of 95.0.
3. Read the water elevation of the Detroit River from the Stevens recorder chart of the recorder installed below the backwater gates at Conner outlet and using this elevation determine from the graph the correction in storage to be applied. (Minus correction for these river elevations which are less than 95.0).

Curve for determining Storage
in Conner-Conant Mt. Elliot system



DATA ON QUANTITY OF OVERFLOW

The periods of surface run-off producing overflows in the Conner system are listed chronologically on the chart which follows along with other pertinent data including the following:

1. Precipitation to start of overflow.
2. Total precipitation during storm.
3. Total calculated overflow.

Columns 1 and 3 showing the date and time of overflow from the Conner sewer is taken from the data available from the recorder chart installed upstream from the backwater gates.

The date and time of overflow from the Conant-Mt. Elliott sewer was secured from the records at the sampler installation in the sewer.

Column 5 showing the approximate length of each storm is taken from the records of the Detroit Metropolitan Rain Gauge Network. Minor precipitation of .01-.02 inch for an hour was neglected.

Column 6 shows the total accumulated precipitation to the beginning of the overflow period. The total accumulated precipitation and the maximum hourly precipitation are shown to give an idea of what kind of storm caused the overflow.

Columns 7 and 8 and the columns 9 and 10 show the water elevations upstream and downstream from the backwater gates at the Conner sewer outlet. The data on the water elevation in the Conner system is taken from the chart of the water level recorder installed upstream from the overflow gates.

The elevation of the Detroit River at the time of overflow was taken from the chart of the water level recorder installed downstream from the backwater gates.

Column 12 shows the total accumulated run-off caused by a storm. To compute the total run-off the formula $Q = CIA$ was used: where Q = total run-off, C = coefficient of imperviousness, I = total accumulated precipitation and A = area of entire basin. The coefficient of imperviousness used was 48% and the area of the basin is 21,807 acres.

Column 13 gives the total calculated overflow to the Detroit River. These figures were obtained by subtracting the available storage from the computed run-off.

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SUMMARY OF DATA FROM STORMS CAUSING OVERFLOW

COL. 1 DATE	COL. 2 SYSTEM	COL. 3 TIME OF OVERFLOW	COL. 4 TIME OVER- FLOWING	COL. 5 APPROX. LGTH. OF STORM	COL. 6 ACCU. IN- TO TIME OF OVER- FLOW	COL. 7 TOTAL ACCU. PRECIP.	COL. 8 MAX. HOURLY PRECIP.	COL. 9 WATER ELEV. IN CONNER PRE STORM	COL. 10 ELEV. DET- ROIT RIV- ER	COL. 11 AVAILABLE STORAGE FT. 3	COL. 12 RUNOFF Q = .481A MILLION FT. 3	COL. 13 TOTAL CALC. OVERFLOW TO RIVER MILLION FT. 3
5/10/63	C. *	0430-1430	10 H	7 H	.63	.64	.25	86.0	94.5	3.7	24.7	21.0
5/17-18, 1963	C.-M. **	2130-0115	3H 45M	8 H	NO RECORD AVAILABLE	.49	.13	NO RECORD	AVAILABLE	5.0 EST.	18.2	13.2
5/16/63	C.-M.	0100-0830	7H 30M	2 H	NO RECORD AVAILABLE	.30	.24	81.7	94.2	4.9	11.5	6.6
5/22/63	C.-M.	2200-0900	11 H	5 H	NO RECORD AVAILABLE	.49	.12	90.9	94.3	1.7	18.7	17.0
5/23/63	C.-M.	0400-1400	10 H	1 H	NO RECORD AVAILABLE	.56	.53	81.5	94.3	5.0	22.0	17.0
5/26/63	C.-M.	0100-2400	23 H	2 H	NO RECORD AVAILABLE	1.62	1.45	84.1	94.5	3.5	71.5	68.0
6/14/63	C.-M.	0600-1030	12H 30M	12 H	NO RECORD AVAILABLE	.73	.17	81.6	93.8	4.7	25.4	20.9
6/15/63	C.-M.	0435-1030	5H 55M	12 H	NO RECORD AVAILABLE	.73	.17	81.6	93.8	3.5	9.9	6.4
6/17/63	C.-M.	2350-0245	3H 55M	2 H	.26	.26	.18	82.2	91.8	3.5	30.5	26.0
6/17/63	C.-M.	1930-0300	7H 30M	4 H	.61	.79	.48	81.0	93.8	4.6	13.4	8.9
6/17/63	C.-M.	1917-2122	2H 05M	4 H	.62	.79	.32	81.8	93.9	4.5	25.2	20.2
6/17/63	C.-M.	1930-0900	13H 30M	1 H	.34	.35	.20	82.3	94.1	5.0	11.0	8.4
6/17/63	C.-M.	1730-2053	3H 23M	1 H	.32	.35	.21	82.3	94.2	4.7	26.6	21.9
6/17/63	C.-M.	1315-2100	7H 45M	5 H	.66	.66	.27	81.4	94.2	4.8	29.8	25.0
6/17/63	C.-M.	1422-2052	6H 30M	5 H	.66	.66	.10	81.4	94.1	3.7	17.5	13.8
6/17/63	C.-M.	NO OVERFLOW & CONNER	NO OVERFLOW & CONNER	7 H	.26	.29	.07	81.7-89.7	-	2.6	8.2	6.3
6/24/63	C.-M.	2154-0120	2H 26M	7 H	.56	.70	.21	81.4	93.7	4.7	9.1	7.1
6/24/63	C.-M.	0455-0925	4H 30M	7 H	.64	.70	.21	81.4	93.7	4.7	9.1	7.1
6/24/63	C.-M.	1430-1900	4H 30M	10 H	.33	.79	.27	81.4	94.2	4.8	29.8	25.0
6/24/63	C.-M.	0208-1610	15H 02M	10 H	.36	.70	.27	81.4	94.2	4.8	29.8	25.0
6/24/63	C.-M.	NO OVERFLOW & CONNER	NO OVERFLOW & CONNER	15 H	.46	.46	.10	82.0-92.0	-	3.7	17.5	13.8
6/31/63	C.-M.	1452-1740	2H 48M	11 H	.18	.22	.05	81.4-87.4	-	1.9	8.2	6.3
6/31/63	C.-M.	0223-0524	3H 01M	10 H	.39	.46	.06	81.7-88.0	-	2.0	9.1	7.1

* - CONNER
** - CONNANT-MT. ELLIOT

SUMMARY OF DATA FROM STORMS CAUSING OVERFLOW

DATE	SYSTEM	TIME OF OVERFLOW	TIME OVER-FLOWING	APPROX. LGTH. OF STORM	ACCUM. IN. TO TIME OF OVER-FLOW	TOTAL ACCUM. PRECIP.	MAX. HOURLY PRECIP.	WATER ELEV. IN CONNER PRE STORM	ELEV. WATER DETROIT RIVER	AVAILABLE STORAGE MILLION FT.3	RUNOFF Q = 48 IA MILLION FT.3	TOTAL CALC. OVERFLOW TO RIVER (MILLION FT.3)
1/9/64	C. *	0500-1550	10M 58M	10 H	.47	.85	.14	81.5	93.2	4.4	32.3	27.9
1/25/64	C.	0155-0533	6M 48M	6 H	.41	.45	.12	81.4	91.5	3.6 *	17.1	13.5
1/31 & 2/1/64	C.	1934-1500	19M 26M	11 H	.19	.24	.04	81.9	92.1	3.8	9.1	5.3
3/22/64	C.	2345-1500	15M 15M	10 H	.69	.71	.29	-	-	5.0 EST.	27.0	22.0
3/25/64	C.	0535-1243	7M 05M	9 H	.59	.64	.20	-	-	5.0 EST.	24.4	19.4
3/25 & 26 1964	C.-M. **	0320-1030	7M 10M	9 H	.23	.64	.20	-	-	5.0 EST.	14.8	9.8
4/24, 1964	C.-M.	1904-0215	6M 14M	8 H	.11	.39	.18	-	-	5.0 EST.	31.9	27.6
4/24, 1964	C.	0000-2000	20 H	13 H	.55	.84	.19	82.2	93.3	4.3	11.0	6.9
4/24, 1964	C.-M.	2122-1956	20M 34M	13 H	.15	.84	.19	-	-	4.1	7.6	5.8
4/24, 1964	C.-M.	0148-1116	6M 28M	8 H	.29	.29	.07	81.4-92.5	-	1.8	23.6	19.0
4/24, 1964	C.-M.	1703-2007	3M 04M	2 H	.20	.20	.08	81.4-87.3	93.5	4.6	41.5	36.8
4/24, 1964	C.-M.	1200-2200	10 H	2 H	.58	.62	.34	81.6	-	4.7	31.2	26.5
4/24, 1964	C.-M.	1119-1612	4M 53M	2 H	.37	.62	.24	-	-	4.7	24.0	19.3
4/27/64	C.	1500-2310	3M 04M	10 H	1.09	1.09	.21	81.4	93.7	4.7	24.0	19.3
4/27/64	C.-M.	1233-2312	10M 39M	10 H	1.09	1.09	.21	81.4	93.7	4.7	24.0	19.3
4/28/64	C.	0314-1242	9M 26M	6 H	.02	.02	.22	81.4	93.7	4.7	24.0	19.3
4/28/64	C.-M.	2228-2255	24M 30M	6 H	.02	.02	.22	81.4	93.7	4.7	24.0	19.3
4/28/64	C.	0030-0130	17 H	4 H	.59	.63	.26	81.4	93.7	4.7	24.0	19.3
4/28/64	C.-M.	0710-1215	5M 05M	4 H	.47	.63	.26	81.4	93.7	4.7	24.0	19.3
5/13/64	C.	0024-0050	22M 34M	5 H	.45	.62	.26	-	-	4.7 EST.	24.0	19.3
5/13/64	C.-M.	0740-1320	5M 40M	5 H	.38	.62	.26	-	-	4.7 EST.	24.0	19.3
5/10/64	C.-M.	1200-1404	2M 04M	1 H	.16	.16	.12	-	-	-	-	-

* C - CONNER
 ** C.-M. - CONNANT-MT. ELI

DATA ON QUALITY OF OVERFLOW

In the Allen Creek District the data collected during each sampling period are tabulated and the accumulated inches of precipitation is shown for each storm.

For every period of surface run-off in the Conner system a graph has been made showing the following:

1. Hourly precipitation.
2. Total accumulated precipitation.
3. Period of overflow.
4. Estimated volume of overflow.
5. Summary of laboratory findings.

Each graph is followed by all the results of the laboratory determinations made on the samples collected.

The data have also been summarized graphically showing the magnitude of each storm and those that caused overflow from the Conner and Conant-Mt. Elliot[†] sewers.

Station: Allen Creek Drain

Date: April 2-3, 1964

Accumulated Inches of Rain

1.1

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Fecal Strep MF/100 ml
2300	640,000	32,000	38,500
0015	180,000	9,000	25,300
0600	21,000	4,200	10,600
0700	16,000	10,600	12,500
0800	21,000	1,250	18,600
0900	32,000	11,200	14,300
Max.	640,000	32,000	38,500
Med.	26,500	9,800	16,450
Min.	16,000	1,250	10,600

Station: Allen Creek Drain

Date: April 21, 1964

Accumulated Inches of Rain

.45

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Fecal Strep MF/100 ml
1053	70,000	-	7,100
1057	100,000	10,000	19,700
1103	200,000	10,000	18,900
1110	120,000	-	9,100
1117	130,000	10,400	
Max.	200,000	10,400	19,700
Med.	120,000	10,000	13,800
Min.	70,000	10,000	7,100

Station: Allen Creek Drain

Date: April 28, 1964

Accumulated Inches of Rain

.68

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Fecal Strep MF/100 ml
2030	260,000	7,000	18,000
2035	210,000	4,000	18,400
2041	290,000	8,000	24,200
2046	290,000	7,000	32,800
2052	430,000	6,000	11,500
2057	500,000	9,000	23,200
2103	520,000	14,000	16,400
2108	500,000	8,000	23,600
Max.	520,000	14,000	32,000
Med.	360,000	7,500	20,800
Min.	210,000	4,000	11,500

Station: Allen Creek Drain

Date: May 8, 1964

Accumulated Inches of Rain

1.22

Time	Coliforms MF/100 ml	Fecal Coliforms MF/100 ml	Fecal Strep MF/100 ml
0443	530,000	58,000	413,000
0448	460,000	72,000	264,000
0454	2,800,000	87,000	309,000
0630	55,000	14,000	140,000
0634	81,000	29,000	97,000
0640	58,000	28,000	93,000
0645	56,000	12,000	68,000
0651	120,000	12,000	71,000
0656	47,000	25,000	88,000
0702	53,000	15,000	91,000
0707	50,000	11,000	49,000
0713	42,000	10,000	36,000
0718	47,000	15,000	53,000
0724	45,000	15,000	44,000
0729	55,000	17,000	42,000
0735	220,000	29,000	47,000
0740	500,000	56,000	69,000
0745	510,000	60,000	72,000
0750	310,000	80,000	72,000
0755	730,000	69,000	88,000
0800	440,000	65,000	94,000
0805	610,000	63,000	92,000
0810	400,000	87,000	90,000
0815	650,000	84,000	86,000
Max.	2,800,000	87,000	413,000
Med.	170,000	29,000	88,000
Min.	42,000	10,000	36,000

Composite from 0443 - 0454

Ammonia Nitrogen .60 ppm
Organic Nitrogen .30 ppm
Phenols 11 ppb
Suspended Solids 949 ppm
Phosphates 2.4 ppm

Composite from 0630 - 0815

Ammonia Nitrogen .55 ppm
Organic Nitrogen .34 ppm
Phenols 1 ppb
Suspended Solids 2062 ppm
Phosphates 2.7 ppm

Station: Allen Creek Drain

Date: June 7, 1964

Accumulated Inches of Rain

1.43

Time	Coliforms MF/100 ml	Fecal Coliforms MF/100 ml	Fecal Strep MF/100 ml
0439	3,200,000	26,000	366,000
0444	1,030,000	30,000	183,000
0450	2,000,000	52,000	179,000
0455	3,200,000	56,000	125,000
1527	5,500,000	86,000	326,000
Max.	5,500,000	86,000	336,000
Med.	3,200,000	52,000	183,000
Min.	1,030,000	26,000	125,000

Composite from 0439 - 0455

Ammonia Nitrogen .67 ppm
Organic Nitrogen .51 ppm

Station: Allen Creek Drain

Date: June 12, 1964

Accumulated Inches of Rain

.48

Time	Coliforms MF/100 ml	Fecal Coliforms MF/100 ml	Fecal Strep MF/100 ml
2005	5,700,000	210,000	160,000
2010	3,400,000	72,000	80,000
2016	3,600,000	250,000	210,000
2021	3,300,000	77,000	90,000
2027	5,900,000	66,000	-
2032	3,100,000	16,000	-
Max.	5,900,000	250,000	210,000
Med.	3,500,000	69,000	125,000
Min.	3,300,000	16,000	80,000

Station: Allen Creek Drain

Date: June 15, 1964

Accumulated Inches of Rain

.60

Time	Coliforms MF/100 ml	Fecal Coliforms MF/100 ml	Fecal Strep MF/100 ml
0305	280,000	26,000	66,000
0310	160,000	28,000	26,000
0315	270,000	38,000	64,000
0320	180,000	25,000	38,000
0325	170,000	16,000	46,000
0330	120,000	14,000	30,000
0335	180,000	31,000	44,000
Max.	280,000	38,000	66,000
Med.	180,000	26,000	44,000
Min.	120,000	14,000	26,000

Station: Allen Creek Drain

Date: June 19, 1964

Accumulated Inches of Rain

.60

Time	Coliforms MF/100 ml	Fecal Coliforms MF/100 ml	Fecal Strep MF/100 ml
2213	19,000,000	56,000	150,000
2216	5,500,000	320,000	90,000

Station: Allen Creek Drain

Date: July 2, 1964

Accumulated Inches of Rain

0.51

Time	Coliforms MF/100 ml	Fecal Coliforms MF/100 ml	Fecal Strep MF/100 ml
1341	120,000	30,000	204,000
1346	2,800,000	96,000	262,000
1352	5,100,000	240,000	214,000
1358	4,700,000	130,000	208,000
1403	3,100,000	130,000	200,000
1408	4,500,000	128,000	168,000
1414	2,100,000	200,000	140,000
1420	2,600,000	184,000	140,000
Max.	5,100,000	240,000	262,000
Med.	2,850,000	130,000	204,000
Min.	120,000	30,000	140,000

A composite of all samples gave the following results:

Ammonia Nitrogen	.44 ppm
Organic Nitrogen	.41 ppm

Station: Allen Creek Drain

Date: July 2, 1964

Accumulated Inches of Rain

.45

Time	Coliforms MF/100 ml	Fecal Coliforms MF/100 ml	Fecal Strep MF/100 ml
2034	2,800,000	14,000	210,000
2039	5,100,000	G 1,500	237,000
2044	4,100,000	G 1,500	142,000
2050	3,500,000	G 1,500	162,000
2055	5,100,000	G 1,500	162,000
2101	4,500,000	G 1,500	184,000
Max.	5,100,000	14,000	237,000
Med.	4,300,000		173,000
Min.	2,800,000		142,000

A composite of all samples gave the following results:

Ammonia Nitrogen	.59 ppm
Organic Nitrogen	.52 ppm

Station: Allen Creek Drain

Date: July 3, 1964

Accumulated Inches of Rain

.45

Time	Coliforms MF/100 ml	Fecal Coliforms MF/100 ml	Fecal Strep MF/100 ml
1348	280,000	26,000 .	96,000
1353	250,000	58,000	-
1402	840,000	142,000	-
Max.	840,000	142,000	-
Med.	280,000	58,000	-
Min.	250,000	26,000	-

Station: Allen Creek Drain

Date: July 20, 1964

Accumulated Inches of Rain

.35

Time	Coliforms MF/100 ml	Fecal Coliforms MF/100 ml	Fecal Strep MF/100 ml
2111	2,900,000	290,000 .	1,000,000
2116	6,800,000	830,000	310,000
2122	2,500,000	440,000	780,000
2127	3,700,000	370,000	730,000
2133	4,700,000	390,000	430,000
Max.	6,800,000	830,000	1,000,000
Med.	3,750,000	390,000	730,000
Min.	2,500,000	290,000	310,000

Results of the composite are as follows:

Ammonia Nitrogen	.45 ppm
Organic Nitrogen	.49 ppm
Suspended Solids	1544 ppm
Phosphates	9.5 ppm

Station: Allen Creek Drain

Date: July 25, 1964

Accumulated Inches of Rain

.30

Time	Coliforms MF/100 ml	Fecal Coliforms MF/100 ml	Fecal Strep MF/100 ml
1422	31,000,000	14,000	540,000
1428	18,000,000	4,300,000	1,010,000
1433	14,000,000	190,000	400,000
1438	17,000,000	1,700,000	630,000
1444	32,000,000	3,000,000	1,840,000
1451	2,900,000	530,000	360,000
Max.	32,000,000	4,300,000	1,840,000
Med.	17,500,000	1,115,000	675,000
Min.	2,900,000	14,000	360,000

Results of the composite are as follows:

Ammonia Nitrogen	.68 ppm
Organic Nitrogen	.00 ppm
Phenols	10 ppb
Suspended Solids	1320 ppm
Phosphates	4.3 ppm

Station: Allen Creek Drain

Date: August 3, 1964

Accumulated Inches of Rain

.30

<u>Time</u>	<u>Coliforms</u> <u>MF/100 ml</u>	<u>Fecal Coliforms</u> <u>MF/100 ml</u>	<u>Fecal Strep</u> <u>MF/100 ml</u>
0527	5,800,000	600,000 .	660,000
0530	500,000	120,000	340,000

Station: Allen Creek Drain

Date: August 11, 1964

Accumulated Inches of Rain

.25

<u>Time</u>	<u>Coliforms</u> <u>MF/100 ml</u>	<u>Fecal Coliforms</u> <u>MF/100 ml</u>	<u>Fecal Strep</u> <u>MF/100 ml</u>
1015	4,100,000	210,000	200,000
1020	8,100,000	2,200,000	330,000

Station: Allen Creek Drain

Date: August 11, 1964

Accumulated Inches of Rain

.40

Time	Coliforms MF/100 ml	Fecal Coliforms MF/100 ml	Fecal Strep MF/100 ml
1110	2,700,000	230,000	130,000
1113	2,900,000	1,000,000	200,000
1116	2,400,000	1,700,000	180,000
1119	2,200,000	1,300,000	300,000
1122	3,900,000	400,000	180,000
1125	1,100,000	600,000	330,000
1128	410,000	900,000	140,000
1131	170,000	150,000	130,000
1134	530,000	330,000	250,000
1137	540,000	20,000	150,000
1140	1,500,000	390,000	220,000
1143	1,400,000	90,000	200,000
Max.	3,900,000	1,700,000	330,000
Med.	1,450,000	395,000	190,000
Min.	170,000	20,000	130,000

Station: Allen Creek Drain

Date: August 11, 1964

Accumulated Inches of Rain

.35

Time	Coliforms MF/100 ml	Fecal Coliforms MF/100 ml	Fecal Strep MF/100 ml
1334	110,000	110,000	110,000
1337	200,000	70,000	120,000
1340	180,000	100,000	150,000
1343	200,000	210,000	130,000
1346	310,000	110,000	220,000
1349	250,000	240,000	90,000
1352	490,000	300,000	240,000
1355	1,500,000	1,000,000	400,000
1358	330,000	80,000	100,000
1401	-	-	-
Max.	1,500,000	1,000,000	400,000
Med.	250,000	110,000	130,000
Min.	110,000	110,000	110,000

	TOTAL COLIFORM MF/100 ml.	TOTAL FECAL 100 ml.
Median	2,000,000	
Minimum	700,000	
Maximum	4,700,000	

0.7 Total Overflow 210 million ft.³

overflow

0.6

Overflow @ Conner Cr.
5-10-63 0430-1430

0.5

accumulated precipitation

0.4

Precipitation in inches on basin

0.2

0.1

9

10

11

MAY 1963

28

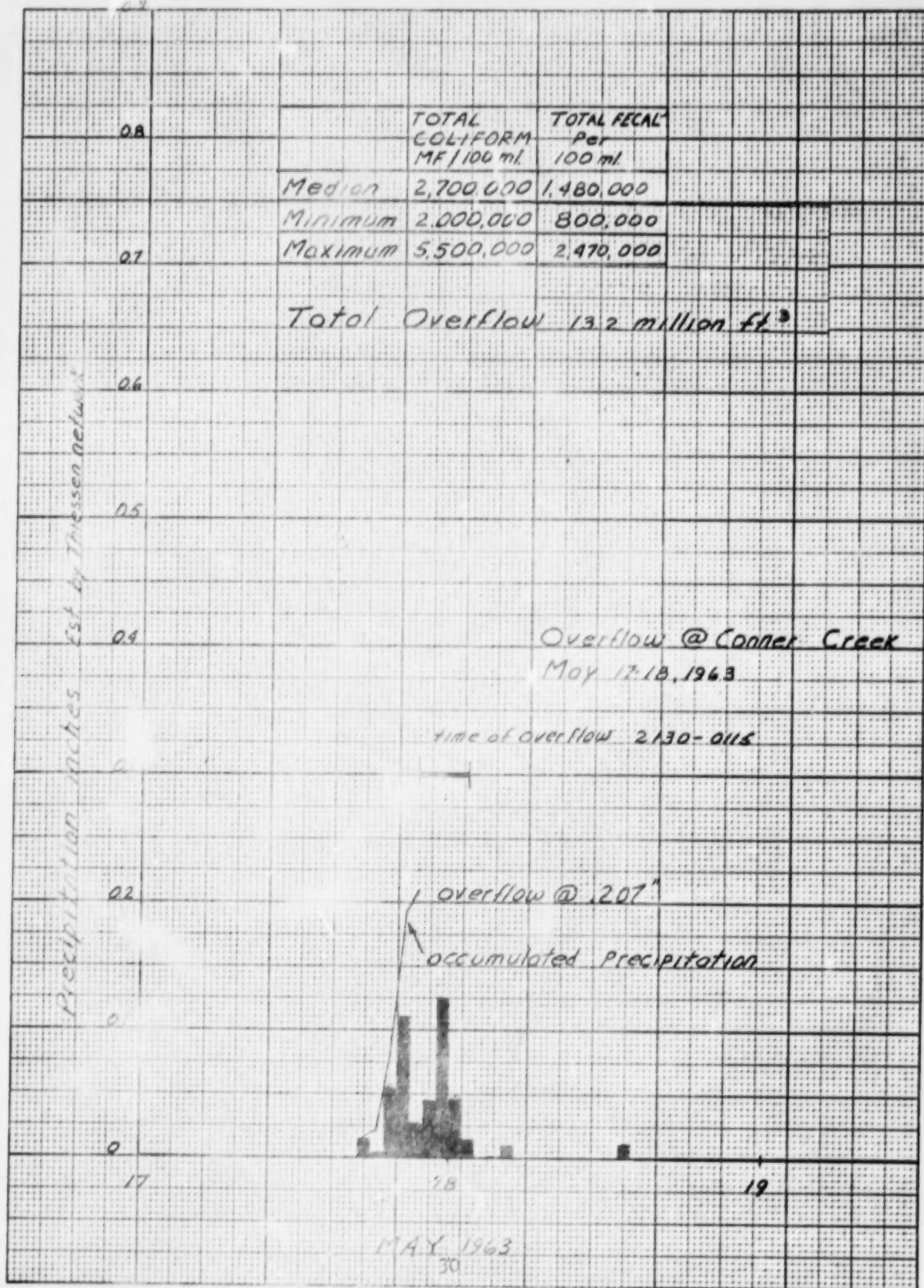
Station: Conners Creek

Date: May 10, 1963

Accumulated Inches of Rain

.64

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Flow (CFS)
0430	4,000,000		
to	2,700,000		
0900	4,700,000		
	1,400,000		
	700,000		
0915	2,700,000		
0930	3,300,000		
1014	300,000		
1200	1,800,000		
1230	1,270,000		
1305	2,200,000		
1325	1,200,000		
Max.	4,700,000		
Med.	2,000,000		
Min.	700,000		



Station: Conners Creek

Date: May 17 & 18, 1963

Accumulated Inches of Rain

.49

Time	Coliforms 10 ⁶ /100 ml	Total Fecal/100 ml	Flow (CFS)
2130	4,500,000	1,800,000	
to	2,000,000	800,000	
0115	2,000,000	1,300,000	
	2,100,000	1,050,000	
	3,200,000	2,400,000	
	2,500,000	1,375,000	
	2,300,000	1,380,000	
	2,200,000	1,600,000	
	2,800,000	1,600,000	
	2,700,000	1,400,000	
	5,500,000	2,470,000	
Max.	5,500,000	2,470,000	
Med.	2,700,000	1,400,000	
Min.	2,000,000	800,000	

1.5

1.4

1.3

1.2

1.1

1.0

0.9

0.8

0.7

0.6

0.5

0.4

0.3

0.2

0.1

Precipitation inches Est by Thiessen network

TOTAL
OVERFLOW
Million
ft³

6.6

17.0

17.0

68.0

June 6, 1963 0100-0830

TOTAL
COLIFORM
MF/100 ml.

TOTAL FECAL
Per
100 ml.

Median

7,800,000

9,500,000

Minimum

4,400,000

3,350,000

Maximum

13,600,000

9,500,000

June 6 & 7, 1963 2200-0900

Median

11,100,000

8,800,000

Minimum

9,800,000

7,200,000

Maximum

15,900,000

10,300,000

June 9, 1963 0400-1400

Median

3,500,000

1,675,000

Minimum

1,000,000

250,000

Maximum

20,000,000

8,000,000

June 10, 1963 0100-2400

Median

1,450,000

525,000

Minimum

820,000

410,000

Maximum

1,600,000

650,000

concrete overflows

accumulated
precipitation

6

7

8

9

10

June 1963

32

Station: Conners Creek

Date: June 6, 1963

Accumulated Inches of Rain

.30

Time	Coliforms MP/100 ml	Total Fecal/100 ml	Flow (CFS)
0130	11,100,000	6,900,000	
	9,800,000	5,900,000	
to	7,300,000	4,375,000	
	5,100,000	3,350,000	
0730	7,300,000	4,750,000	
	8,200,000	4,100,000	
	5,800,000	4,050,000	
	7,700,000	4,200,000	
	8,100,000	5,200,000	
	6,300,000	-	
	8,500,000	5,600,000	
	8,000,000	-	
	8,500,000	3,800,000	
	7,800,000	-	
	8,700,000	4,800,000	
	5,200,000	-	
	7,400,000	4,450,000	
	4,400,000	-	
	5,000,000	4,250,000	
	7,800,000	-	
	13,500,000	9,500,000	
	9,200,000	-	
	8,300,000	4,550,000	
Max.	13,500,000	9,500,000	
Med.	7,800,000	4,500,000	
Min.	4,400,000	3,350,000	

Station: Conners Creek

Date: June 6 & 7, 1963

Accumulated Inches of Rain

.49

Time	Coliforms MP/100 ml	Total Fecal/100 ml	Flow (CFS)
2000	13,000,000	9,100,000	
to	11,100,000	7,200,000	
2100	15,900,000	10,300,000	
	11,100,000	8,300,000	
	9,800,000	8,800,000	
Max.	15,900,000	10,300,000	
Med.	11,100,000	8,300,000	
Min.	9,800,000	7,200,000	

Station: Conners Creek

Date: June 9, 1963

Accumulated Inches of Rain

.58

Time	Coliforms MP/100 ml	Total Fecal/100 ml	Flow (CFS)
0353	20,000,000	8,000,000	
0408	6,300,000	2,400,000	
0422	3,200,000	-	
0438	3,500,000	4,500,000	
0452	4,500,000	-	
0508	1,400,000	1,050,000	
0522	3,500,000	-	
0540	3,200,000	1,000,000	
0555	3,300,000	-	
0612	2,900,000	500,000	
0626	3,400,000	-	
0652	4,500,000	1,500,000	
0707	3,700,000	-	
0722	3,800,000	2,300,000	
0737	3,200,000	-	
0744	3,500,000	1,400,000	
0757	3,500,000	1,750,000	
0956	1,000,000	250,000	
1010	4,100,000	2,050,000	
1020	2,200,000	1,200,000	
1036	2,500,000	800,000	
Max.	20,000,000	8,000,000	
Med.	3,500,000	1,075,000	
Min.	1,000,000	250,000	

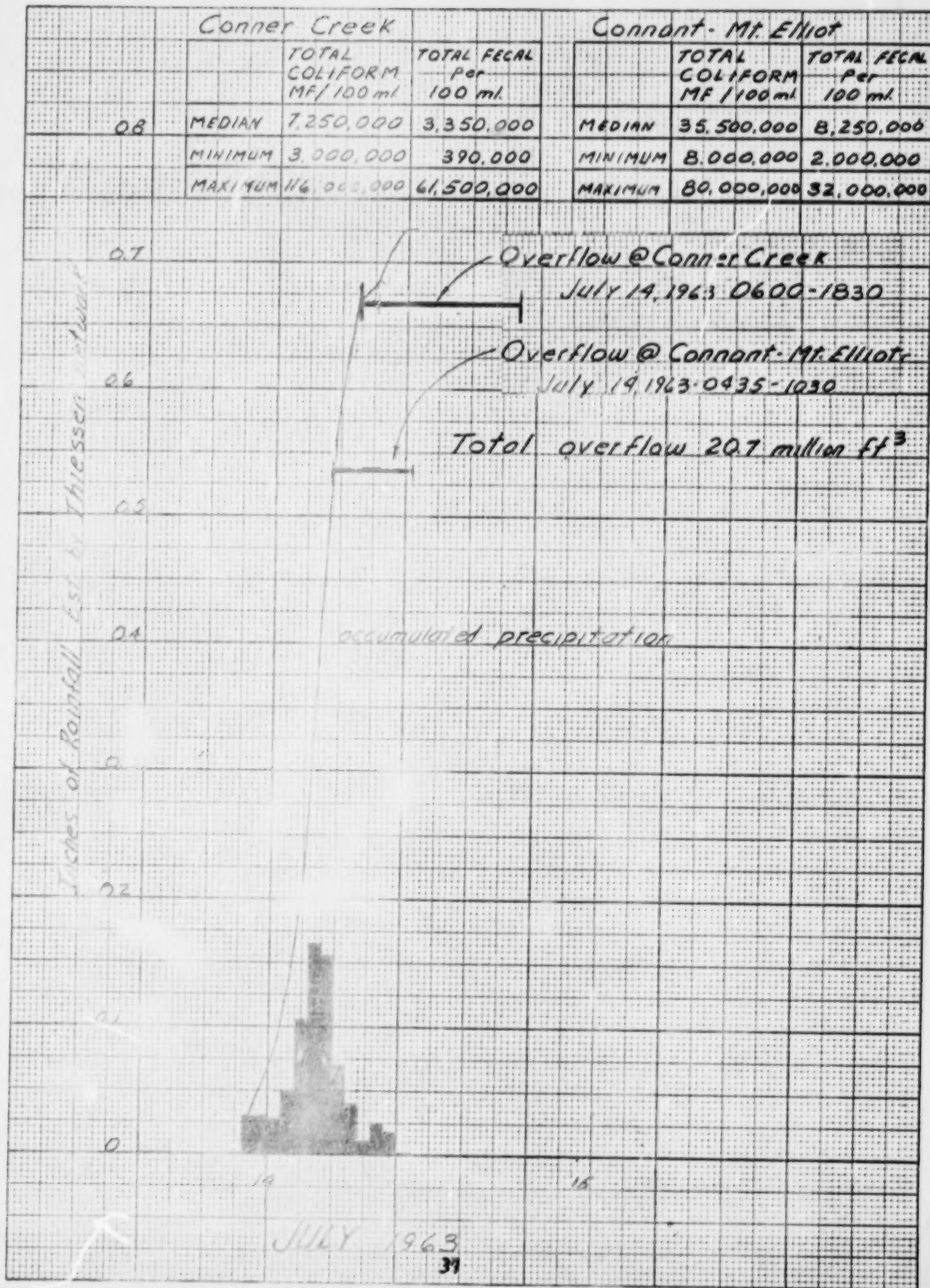
Station: Conners Creek

Date: June 10, 1963

Accumulated Inches of Rain

1.02

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Flow (CFS)
0920	820,000	410,000	
0952	1,600,000	-	
1004	1,500,000	525,000	
1020	1,400,000	-	
1036	1,300,000	550,000	
1050	1,600,000	-	
Max.	1,600,000	550,000	
Med.	1,450,000	525,000	
Min.	820,000	410,000	



Station: Leib & Jefferson

Date: July 14, 1963

Accumulated Inches of Rain

.73

Time	Coliforms MP/100 ml	Total Fecal/100 ml	Flow (CFS)
0435	56,000,000	25,000,000	
0544	47,000,000	21,200,000	
0550	35,000,000	17,500,000	
0615	57,000,000	22,800,000	
0630	22,000,000	2,900,000	
0800	38,000,000	9,750,000	
0830	30,000,000	8,100,000	
0900	29,000,000	2,000,000	
0915	13,000,000	4,300,000	
0930	42,000,000	8,400,000	
0945	10,200,000	7,500,000	
1000	80,000,000	32,000,000	
1015	8,000,000	3,200,000	
1030	20,000,000	5,200,000	
Max.	80,000,000	32,000,000	
Min.	35,500,000	8,250,000	
Avg.	3,000,000	2,000,000	

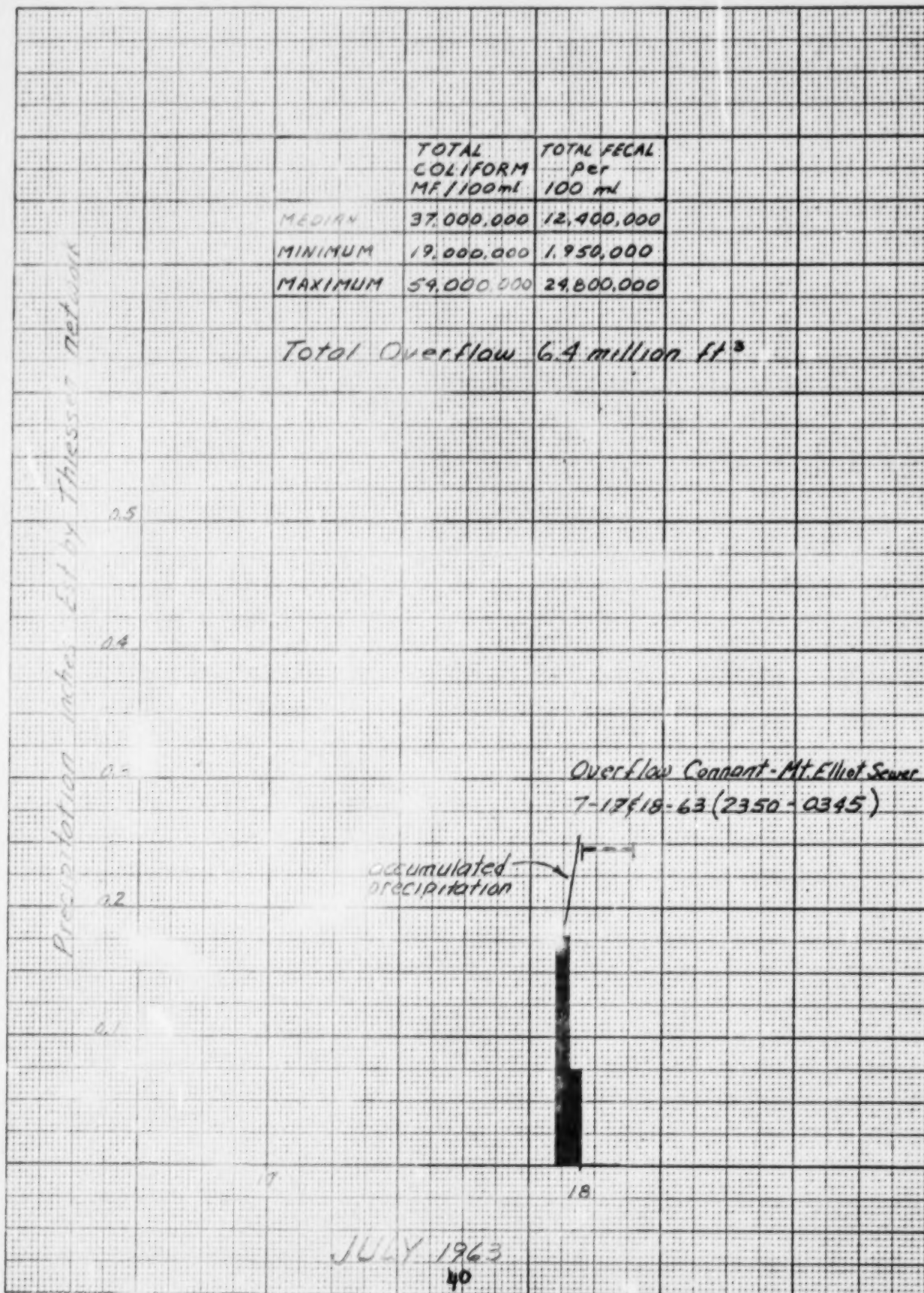
Station: Conners Creek

Date: July 14, 1963

Accumulated Inches of Rain

.73

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Flow (CFS)
0745	17,000,000	7,650,000	
0800	7,900,000	3,550,000	
0815	7,800,000	2,200,000	
0830	7,200,000	3,600,000	
0845	6,600,000	3,750,000	
0900	6,400,000	2,900,000	
0915	6,500,000	3,250,000	
0931	5,000,000	1,750,000	
0947	3,800,000	1,900,000	
1003	3,000,000	1,800,000	
1019	35,000,000	9,450,000	
1035	54,000,000	21,600,000	
1048	35,000,000	14,000,000	
1105	90,000,000	-	
1121	5,900,000	1,600,000	
1137	6,400,000	2,550,000	
1153	3,000,000	390,000	
1208	15,000,000	10,000,000	
1224	5,200,000	1,040,000	
1240	7,200,000	1,950,000	
1255	116,000,000	61,500,000	
1309	8,400,000	3,350,000	
1325	26,000,000	8,500,000	
1341	80,000,000	42,500,000	
Max.	116,000,000	61,500,000	
Med.	7,250,000	3,350,000	
Min.	3,000,000	390,000	



Station: Leib & Jefferson

Date: July 17-18, 1963

Accumulated Inches of Rain

.26

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Flow (CFS)
2350	37,000,000	13,000,000	
0005	31,000,000	14,000,000	
0020	50,000,000	16,500,000	
0035	54,000,000	24,800,000	
0050	46,000,000	12,400,000	
0105	43,000,000	11,500,000	
0112	51,000,000	16,800,000	
0128	44,000,000	6,100,000	
0144	45,000,000	14,800,000	
0159	31,000,000	2,200,000	
0214	33,000,000	15,200,000	
0229	28,000,000	1,950,000	
0244	33,000,000	8,900,000	
0300	25,000,000	6,750,000	
0315	39,000,000	21,000,000	
0330	36,000,000	9,750,000	
0345	19,000,000	8,750,000	
Max.	54,000,000	24,800,000	
Med.	37,000,000	12,400,000	
Min.	19,000,000	1,950,000	

EUGENE IETZ CO.
MADE IN U.S.A.
NO. 5 GEN. P. 20 X 20 PER INCH

Precipitation values Est. by Thiessen method

Conner Creek

0.8

	TOTAL COLIFORM MF/100 ml	TOTAL FECAL Per 100 ml
MEDIAN	43,000,000	9,300,000
MIN	11,000,000	1,500,000
MAX	125,000,000	37,600,000

accumulated precipitation

0.7

Connant Mt. Elliot

	TOTAL COLIFORM MF/100 ml	TOTAL FECAL Per 100 ml
MEDIAN	44,000,000	12,400,000
MIN	26,000,000	5,200,000
MAX	73,000,000	22,000,000

Overflow Connant Mt. Elliot
7-22-63 1917-1922

0.6

0.5 Total Overflow 26.9 mil ft.³

Overflow Conner Creek
7-22 & 23, 1963 1930-0300

0.4

0.3

0.2

0.1

JULY 1963
42

Station: Conners Creek

Date: July 22, 1963

Accumulated Inches of Rain

.72

Time	Coliforms MP/100 ml	Total Fecal/100 ml	Flow (CFS)
1906	61,000,000	12,200,000	
1930	102,000,000	20,400,000	
1955	100,000,000	10,000,000	
2020	100,000,000	21,200,000	
2044	93,000,000	9,300,000	
2110	125,000,000	-	
2135	43,000,000	8,600,000	
2201	53,000,000	-	
2225	43,000,000	8,600,000	
2250	29,000,000	2,900,000	
2315	39,000,000	11,700,000	
2340	47,000,000	4,700,000	
0006	54,000,000	15,200,000	
0031	94,000,000	37,600,000	
0055	27,000,000	5,400,000	
0120	22,000,000	-	
0145	11,000,000	2,200,000	
0210	40,000,000	12,000,000	
0235	45,000,000	4,500,000	
0259	15,000,000	1,500,000	
0324	40,000,000	8,000,000	
0348	35,000,000	10,500,000	
0413	30,000,000	14,500,000	
0437	27,000,000	5,400,000	
Max.	125,000,000	37,600,000	
Med.	43,000,000	9,300,000	
Min.	11,000,000	1,500,000	

Station: Leib & Jefferson

Date: July 22, 1963

Accumulated Inches of Rain

.72

Time	Coliforms 12/100 ml	Total Fecal/100 ml	Flow (CFS)
1917	73,000,000	7,300,000	
1939	25,000,000	-	
1956	52,000,000	5,200,000	
2018	41,000,000	12,300,000	
2036	31,000,000	12,400,000	
2100	44,000,000	22,000,000	
2122	49,000,000	-	
Max.	73,000,000	22,000,000	
Med.	44,000,000	12,400,000	
Min.	25,000,000	5,200,000	

Precipitation index set by Thurston netting

Conner Creek

	TOTAL COLIFORM MF/100 ml	TOTAL FECAL Per 100 ml
MEDIAN	SAMPLES RUINED	
MINIMUM		
MAXIMUM		

Connant Mt. Elliot

	TOTAL COLIFORM MF/100 ml	TOTAL FECAL Per 100 ml
MEDIAN	Samples RUINED	
MINIMUM		
MAXIMUM		

Total Overflow 8.9 million ft.³

Overflow Connant-Mt. Elliot Sewer
7-28-63 - 1730-2053

Overflow Conner Creek
July 28 & 29 1930-0900

JULY 1963

I
 EUGENE L. HETZ, CO.
 MADE IN U. S. A.
 20 GEN IN P
 20 X 20 PER INCH
 NO. 3

Precipitation index estimated by Thiessen network

Connant Mt Elliot

Conner Creek

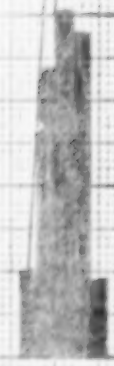
	TOTAL COLIFORM MF/100ml	TOTAL FECAL Per 100 ml.		TOTAL COLIFORM MF/100ml	TOTAL FECAL Per 100 ml
MEDIAN	12,600,000	12,600,000	MEDIAN	23,000,000	16,000,000
MINIMUM	1,800,000	1,900,000	MINIMUM	9,000,000	9,000,000
MAXIMUM	111,000,000	30,000,000	MAXIMUM	59,000,000	41,000,000

Total Overflow 202 million ft³

accumulated precipitation

Overflow from Connant Mt
 Elliot Relief Sewer
 8-9-63 1922-2052

Overflow from Conner Creek
 8-9-63 1315-2100



August 1963

Station: Connors Creek

Date: August 2, 1963

Accumulated Inches of Rain

.66

Time	Coliforms 1F/100 ml	Total Fecal/100 ml	Flow (CFS)
1315	1,000,000	-	
1339	35,000,000	32,000,000	
1352	43,000,000	25,000,000	
1409	27,000,000	11,000,000	
1426	20,000,000	12,000,000	
1444	59,000,000	41,000,000	
1501	20,000,000	12,000,000	
1519	21,000,000	-	
1535	41,000,000	37,000,000	
1554	32,000,000	25,000,000	
1611	31,000,000	36,000,000	
1629	23,000,000	21,000,000	
1646	35,000,000	-	
1704	25,000,000	25,000,000	
1721	15,000,000	16,000,000	
1738	14,000,000	14,000,000	
1755	9,000,000	9,000,000	
1813	14,000,000	11,000,000	
1830	31,000,000	-	
1848	15,000,000	10,500,000	
1905	23,000,000	16,000,000	
1923	19,000,000	19,000,000	
1940	23,000,000	23,000,000	
1958	25,000,000	25,000,000	
Max.	59,000,000	41,000,000	
Med.	23,000,000	15,000,000	
Min.	9,000,000	9,000,000	

Station: Leib and Jefferson

Date: August 9, 1963

Accumulated Inches of Rain

.55

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Flow (GFS)
1422	1,900,000	1,900,000	
1433	1,800,000	-	
1455	19,800,000	13,000,000	
1519	9,300,000	-	
1541	4,500,000	4,500,000	
1603	8,900,000	-	
1626	12,500,000	12,500,000	
1648	31,000,000	-	
1709	30,000,000	30,000,000	
1732	23,000,000	-	
1755	111,000,000	-	
1817	1,000,000	-	
1839	72,000,000	-	
1901	75,000,000	-	
1924	50,000,000	-	
1946	107,000,000	-	
2008	59,000,000	-	
2030	40,000,000	-	
2052	75,000,000	-	
Max.	111,000,000	30,000,000	
Med.	12,500,000	12,500,000	
Min.	1,000,000	1,900,000	

Precipitation in inches on basin by Thiessen network

0.8

0.7

0.6

0.5

0.4

0.3

0.2

0.1

TOTAL
COLIFORM
MF/100 ml.

TOTAL FECAL
Per
100 ml.

MEDIAN

47,500,000

9,400,000

MINIMUM

18,000,000

1,800,000

MAXIMUM

100,000,000

17,400,000

Total Overflow 8.4 million ft³

Overflow @ Cannant

Aug 13 & 14, 1963 2154-0120

AUGUST 1963

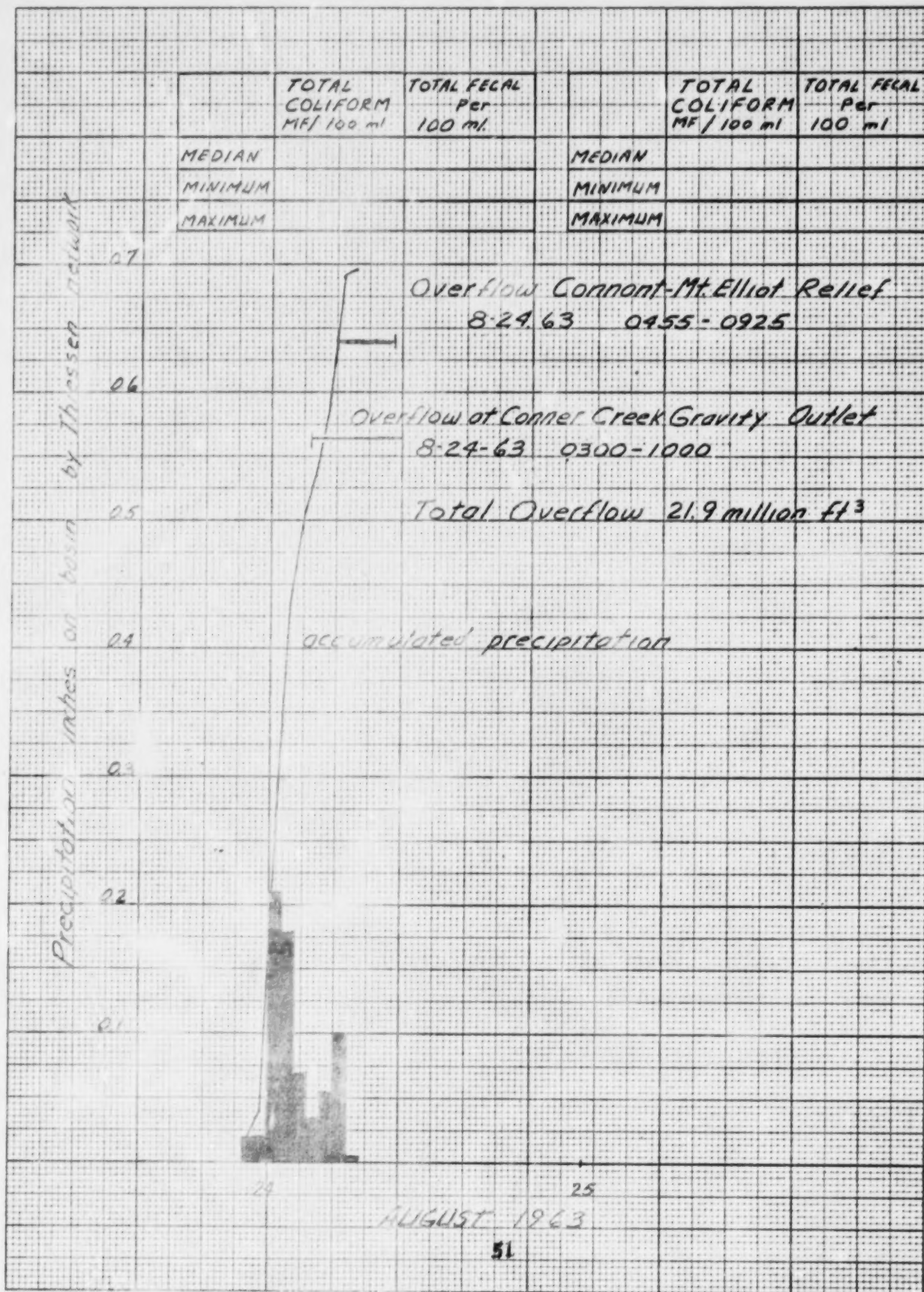
Station: Leib & Jefferson

Date: August 13-14, 1963

Accumulated Inches of Rain

.29

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Flow (CFS)
2154	55,000,000	13,000,000 .	
2216	53,000,000	10,500,000	
2238	47,000,000	9,400,000	
2301	38,000,000	7,500,000	
2323	55,000,000	17,400,000	
2354	48,000,000	4,800,000	
0016	100,000,000	-	
0037	36,000,000	-	
0058	18,000,000	1,800,000	
0120	21,000,000	-	
Max.	100,000,000	17,400,000	
Med.	47,500,000	2,400,000	
Min.	18,000,000	1,800,000	



Station: Conners Creek

Date: August 24, 1963

Accumulated Inches of Rain

.70

Time	Coliforms MP/100 ml	Total Fecal/100 ml	Flow (CFS)
0345	11,000,000	-	
0407	20,000,000	-	

Precipitation in inches or basin by Thresher network

Conner Creek

	TOTAL COLIFORM MF / 100 ml.	TOTAL FECAL Per 100 ml.
MEDIAN	11,500,000	5,500,000
MINIMUM	3,100,000	800,000
MAXIMUM	29,000,000	13,000,000

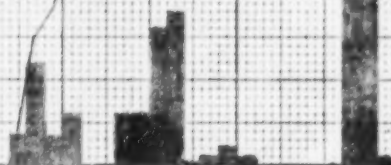
Connant Mt. Elliot

	TOTAL COLIFORM MF / 100 ml.	TOTAL FECAL Per 100 ml.
MEDIAN	24,500,000	3,950,000
MINIMUM	2,700,000	1,080,000
MAXIMUM	59,000,000	9,000,000

05 Total Overflow 25.0 million ft³

Overflow @ Conner
9-12-63 1430-1900

Overflow Connant Mt Elliot
9-12, 63 0308-1810



SEPT. 1963

Station: Conners Creek

Date: September 12, 1963

Accumulated Inches of Rain

.79

Time	Coliforms MP/100 ml	Total Fecal/100 ml	Flow (CFS)
0740*	3,100,000		
0810**	3,300,000		
1427***	3,900,000	780,000	
1457	7,000,000	3,150,000	
1533	15,000,000	6,400,000	
1603	21,000,000	5,670,000	
1643	29,000,000	13,050,000	
1712	21,000,000	750,000	
Max.	29,000,000	13,000,000	
Med.	11,500,000	5,500,000	
Min.	3,100,000	800,000	

*Started
**Stopped
***Started

Station: Leib & Jefferson

Date: September 12, 1963

Accumulated Inches of Rain

.79

Time	Coliforms MP/100 ml	Total Fecal/100 ml	Flow (CFS)
0300	59,000,000		
0330	43,000,000		
0400	40,000,000		
0430	31,000,000		
0500	28,000,000		
0530	43,000,000		
1340	17,000,000	5,950,000	
1410	2,700,000	1,620,000	
1440	3,600,000	1,080,000	
1510	5,200,000	3,450,000	
1540	30,000,000	7,800,000	
1610	22,000,000	4,400,000	
1640	27,000,000	5,400,000	
1710	17,000,000	1,700,000	
1740	12,000,000	2,400,000	
1810	18,000,000	9,000,000	
Max.	59,000,000	9,000,000	
Med.	24,500,000	3,950,000	
Min.	2,700,000	1,000,000	

Precipitation in inches on basin by Thiessen network

0.8

0.7

0.6

0.5

0.4

0.3

0.2

0.1

Total Overflow 13.8 million ft³

Overflow @ Connant Mt. Hist
Sept. 20, 1963 1200 - 1410



19

20

SEPT.

56

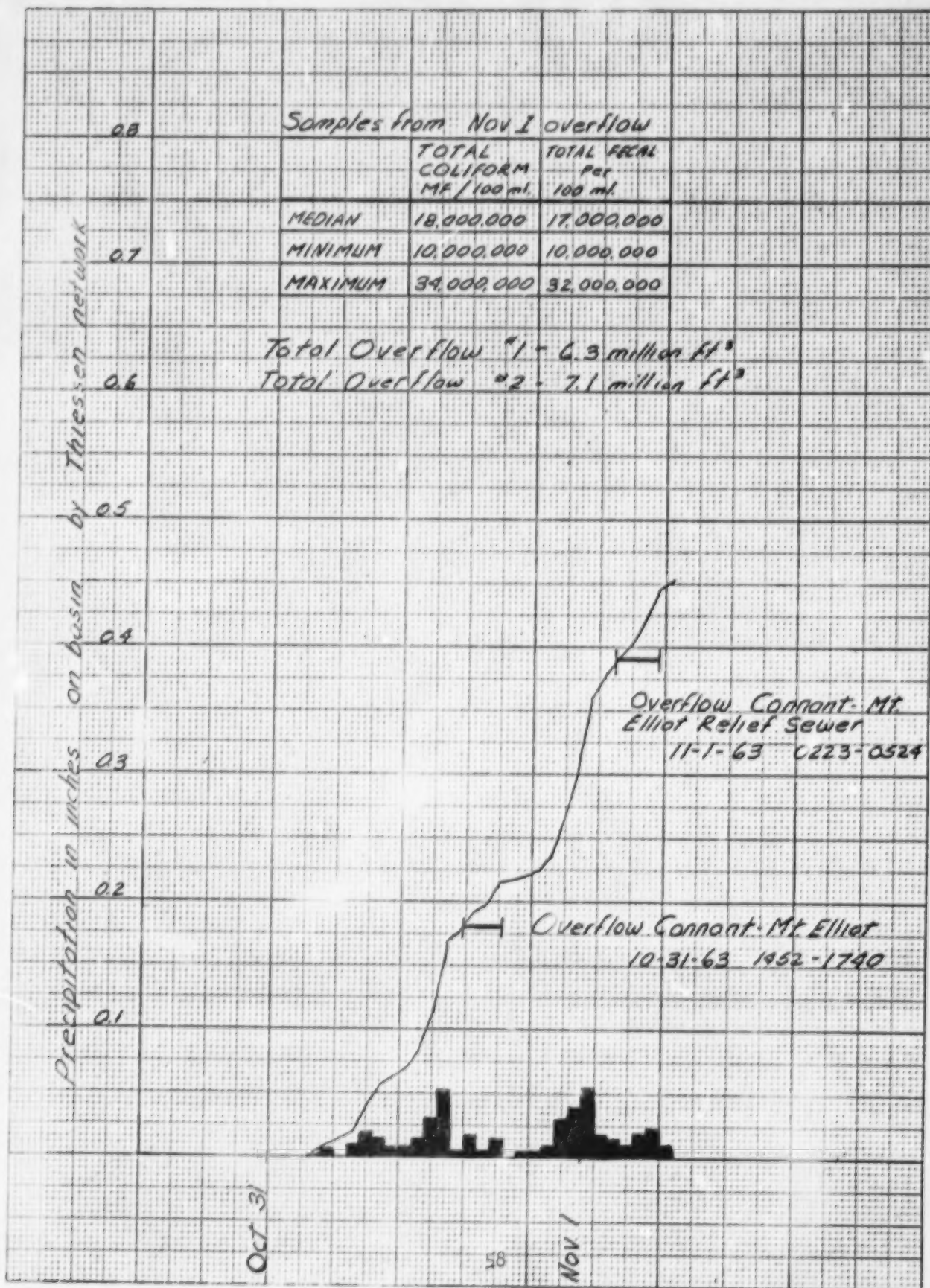
Station: Leib & Jefferson

Date: September 20, 1963

Accumulated Inches of Rain

.46

Time	Coliforms MP/100 ml	Total Fecal/100 ml	Flow (CFS)
1610	4,000,000	2,200,000	



Station: Leib & Jefferson

Date: October 31, 1963

Accumulated Inches of Rain

.22

<u>Time</u>	<u>Coliforms</u> <u>MF/100 ml</u>	<u>Total</u> <u>Fecal/100 ml</u>	<u>Flow</u> <u>(CFS)</u>
1452	900,000	900,000	

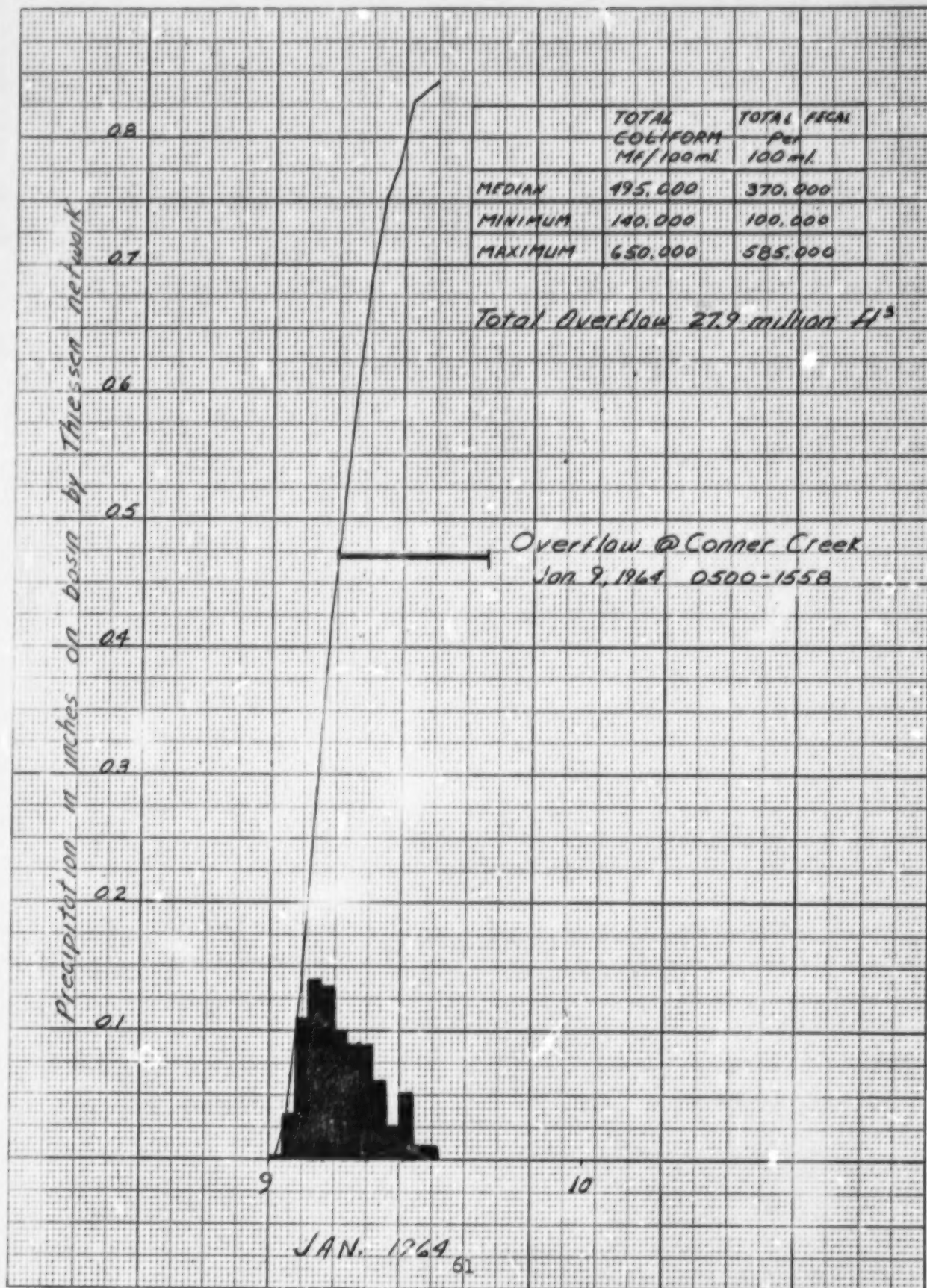
Station: Leib & Jefferson

Date: November 1, 1963

Accumulated Inches of Rain

.46

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Flow (CFS)
0223	10,000,000	10,000,000	
0255	30,000,000	27,000,000	
0328	21,000,000	20,000,000	
0400	34,000,000	32,000,000	
0433	11,500,000	11,500,000	
0512	15,000,000	14,000,000	
Max.	34,000,000	32,000,000	
Med.	18,000,000	17,000,000	
Min.	10,000,000	10,000,000	



Station: Conners Creek

Date: January 9, 1964

Accumulated Inches of Rain

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Fecal Strep MF/100 ml
1056	590,000	265,000	430,000
1124	510,000	280,000	320,000
1152	140,000	100,000	310,000
1217	310,000	200,000	490,000
1246	480,000	360,000	410,000
1312	550,000	520,000	430,000
1340	580,000	480,000	340,000
1408	480,000	450,000	390,000
1436	570,000	400,000	450,000
1503	480,000	380,000	500,000
1531	410,000	250,000	510,000
1558	350,000	585,000	350,000
Max.	590,000	585,000	
Med.	495,000	370,000	
Min.	140,000	100,000	

NO. 1 20 GEN 20 PER INCH 20 X 20 PER INCH EUGENE METEOR. CO. MADE IN U.S.A.

Precipitation on basis of Thiessen net work

0.8

0.7

0.6

0.5

0.4

0.3

0.2

0.1

TOTAL COLIFORM MF/100 ml.

MEDIAN 480,000

MINIMUM 250,000

MAXIMUM 3,900,000

Total Overflow 13.5 million ft³

Overflow Conner Creek
1-25-64 0155-0833

24

25

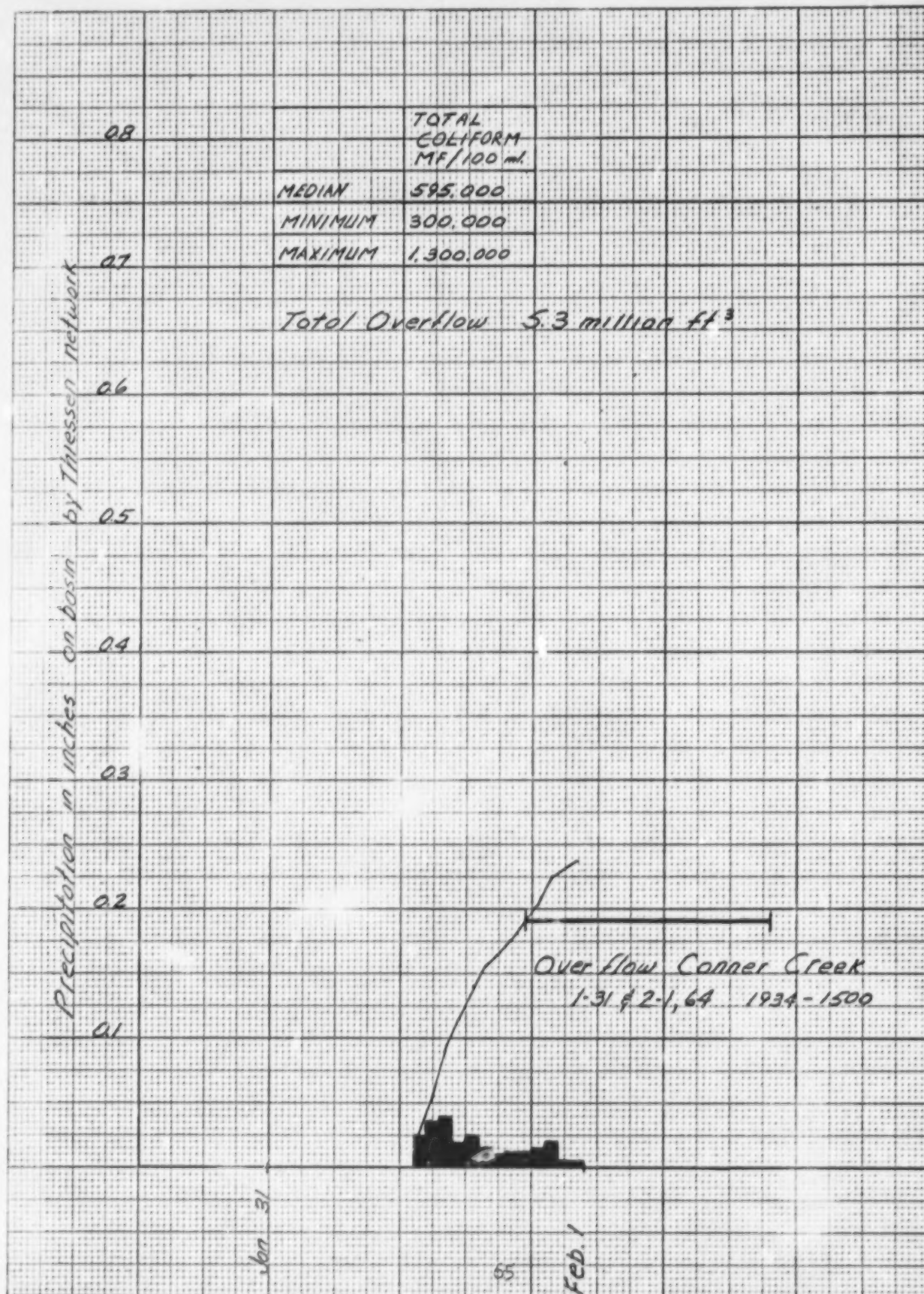
JAN. 1964
63

Station: Conners Creek

Date: January 24-25, 1964

Accumulated Inches of Rain

Time	Coliforms MP/100 ml	Chlorides (ppm)
2355	1,600,000	183
0025	3,900,000	171
0055	2,700,000	123
0124	870,000	116
0155	480,000	120
0225	480,000	121
0255	590,000	93
0325	510,000	93
0355	250,000	104
0425	320,000	99
0455	350,000	95
0503	300,000	93
0633	310,000	83
0722	390,000	101
0741	650,000	107
0811	790,000	104
0833	350,000	100
Max.	3,900,000	
Med.	500,000	
Min.	250,000	



08	TOTAL COLIFORM MF/100 ml
07	MEDIAN 595,000
	MINIMUM 300,000
	MAXIMUM 1,300,000

by Thiessen network
 06
 05

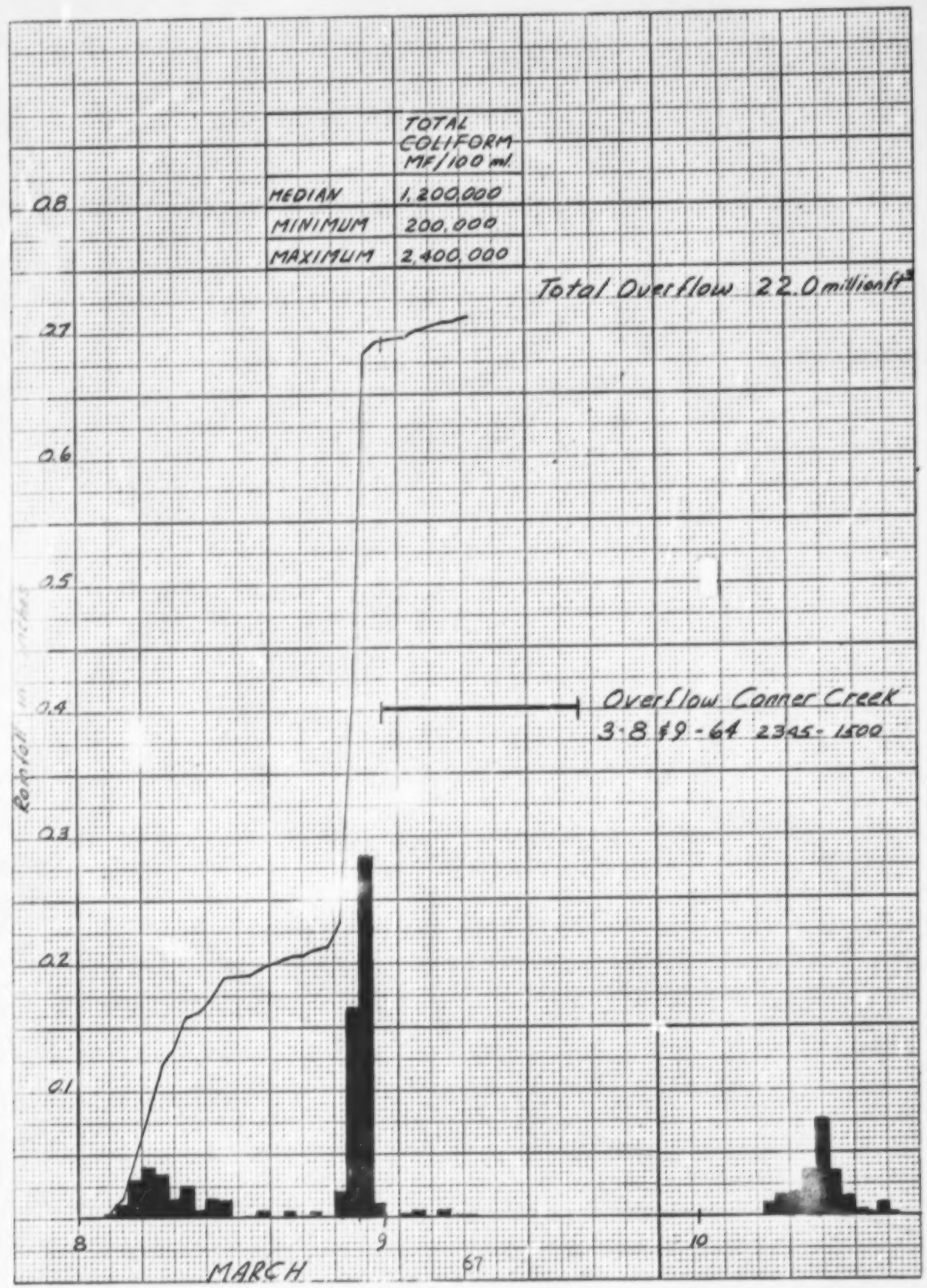
Station: Conners Creek

Date: January 31-February 1, 1964

Accumulated Inches of Rain

Time	Coliforms 1F/100 ml	Chlorides (ppm)
1934	1,300,000	255
2004	830,000	302
2034	700,000	291
2104	680,000	295
2134	520,000	259
2204	600,000	240
2234	800,000	274
2316	700,000	354
2346	1,200,000	281
0018	333,000	243
0049	720,000	190
0119	680,000	216
0150	740,000	205
0219	530,000	199
0250	590,000	202
0319	440,000	184
0350	430,000	175
0420	430,000	182
0451	540,000	152
0522	640,000	160
0523	500,000	173
0726	600,000	165
1011	910,000	143
1309	300,000	142
Max.	1,300,000	
Med.	525,000	
Min.	300,000	

NO. 20 2GEN PH 1 20 X 20 PER INCH
EUG. DIETZ CO. MADE IN U. S. A.

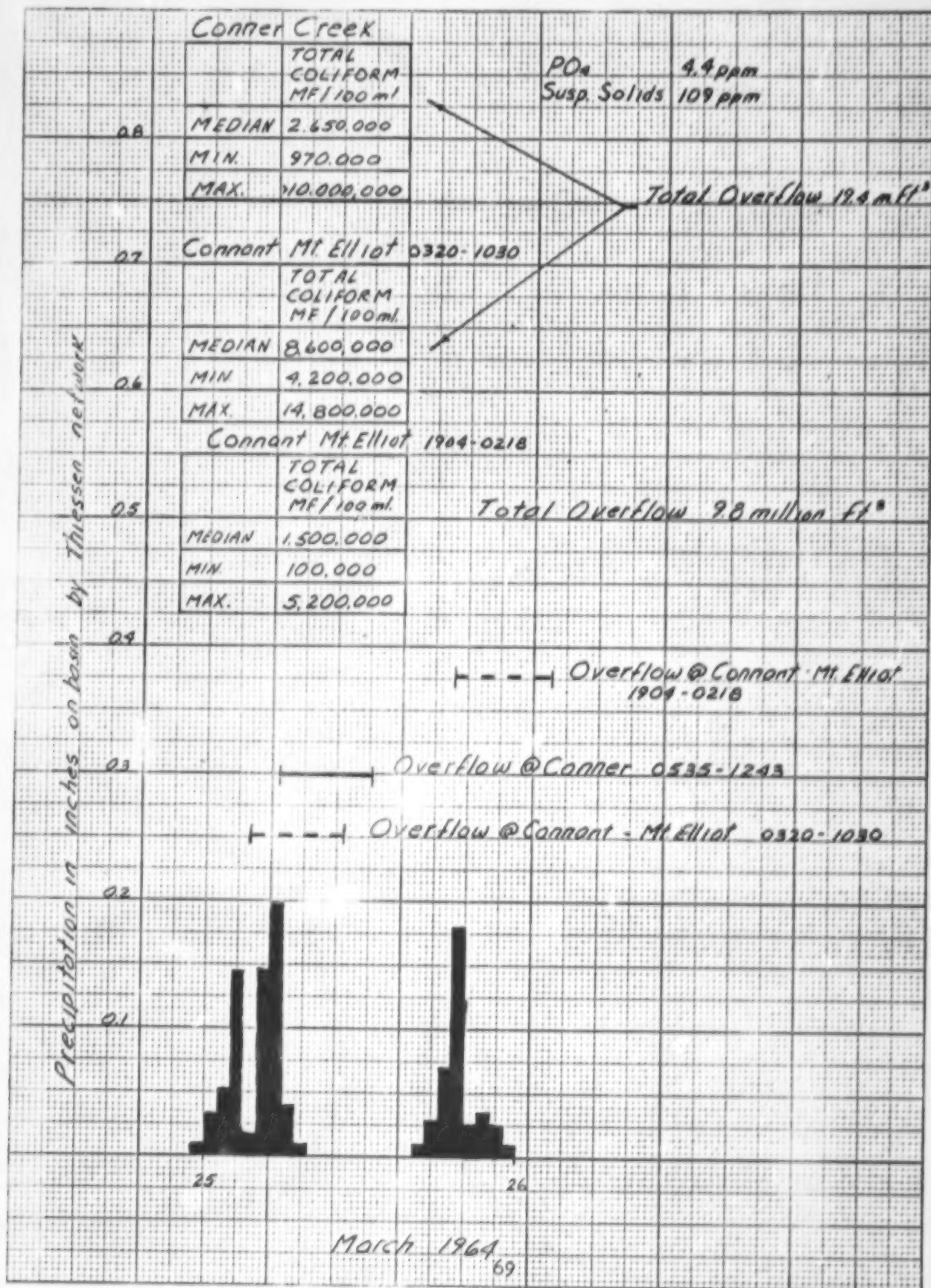


Station: Conners Creek

Date: March 8-9, 1974

Accumulated Inches of Rain

Time	Coliforms MP/100 ml	Chloride (ppm)	Flow (CFS)
2345	2,200,000	152	
0015	4,300,000	-	
0045	3,900,000	-	
0115	1,000,000	75	
0145	1,500,000	-	
0215	1,100,000	-	
0245	2,400,000	53	
0315	2,200,000	-	
0345	900,000	-	
0415	1,300,000	55	
0445	1,200,000	-	
0515	1,500,000	-	
0545	1,200,000	57	
0615	1,200,000	-	
0645	2,200,000	-	
0715	1,500,000	70	
0745	1,500,000	-	
0815	900,000	-	
0845	1,300,000	54	
0915	1,500,000	-	
0945	700,000	-	
1015	1,000,000	57	
1045	200,000	-	
1115	1,200,000	-	
1215	1,700,000	-	
1504	850,000	-	
Max.	2,400,000		
Med.	1,200,000		
Min.	200,000		



Station: Conners Creek

Date: March 25, 1964

Accumulated Inches of Rain

Time	Coliforms MP/100 ml	Chlorides (ppm)
0535	10,000,000	41
0605	10,000,000	38
0635	5,100,000	39
0705	5,200,000	-
0735	10,000,000	-
0805	4,000,000	35
0837	2,300,000	-
0908	2,000,000	-
0938	3,000,000	15
1009	1,400,000	-
1119	1,200,000	-
1143	1,700,000	15
1214	970,000	-
1243	2,000,000	-
Max.	10,000,000	
Med.	2,300,000	
Min.	970,000	

A composite of the above samples gave the following results:

Phosphates 4.4 ppm
Suspended Solids 109 ppm

Station: Leib & Jefferson

Date: March 25, 1964

Accumulated Inches of Rain

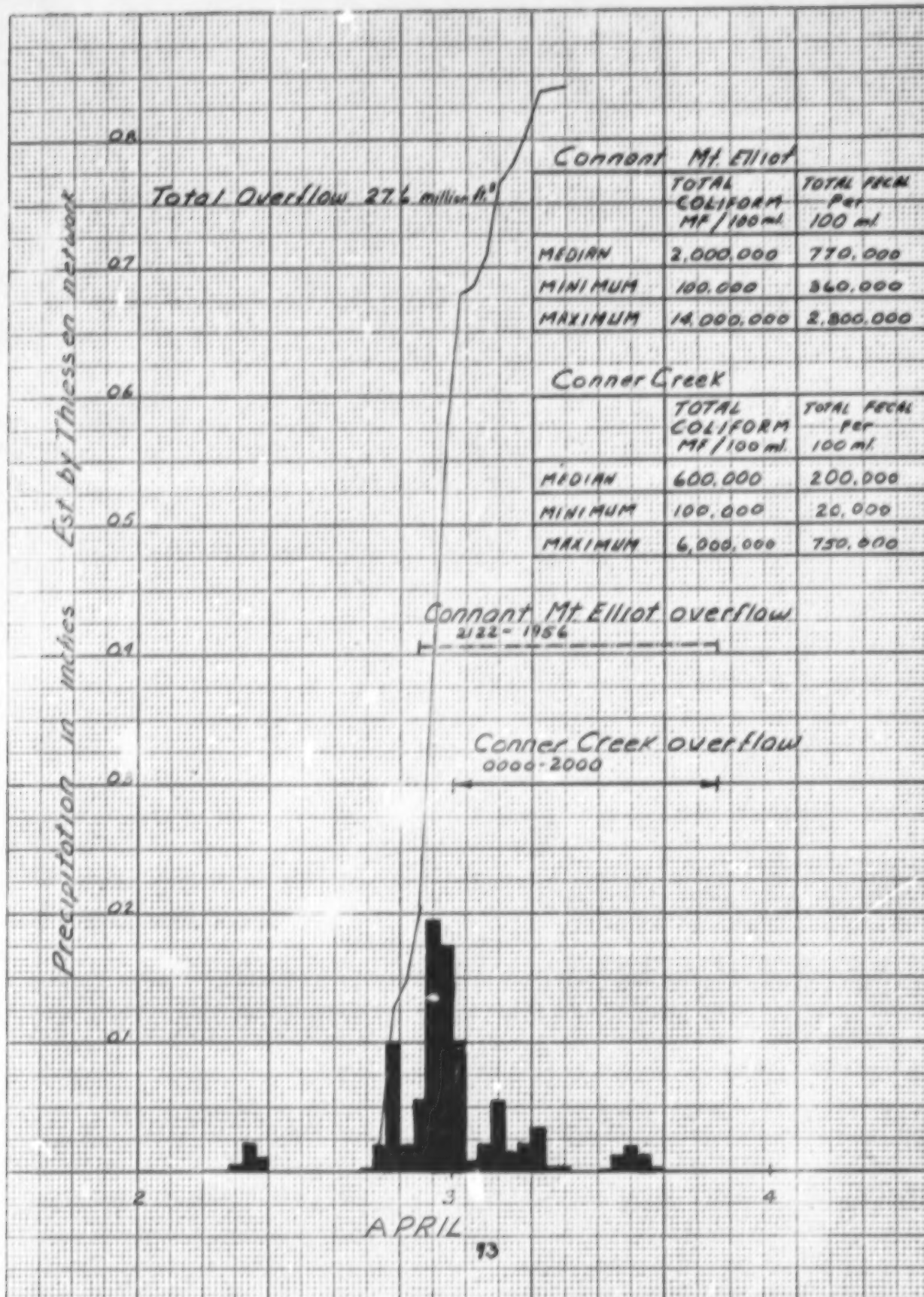
Time	Coliforms MF/100 ml	Chlorides (ppm)
0320	7,000,000	61
0354	7,400,000	55
0426	8,700,000	65
0500	11,500,000	-
0532	14,500,000	-
0605	10,000,000	27
0638	14,800,000	-
0711	8,500,000	-
0744	7,200,000	27
0817	5,400,000	-
0851	10,000,000	-
0924	4,200,000	17
0957	5,000,000	-
1030 (est)	12,800,000	-
Max.	14,800,000	
Med.	8,500,000	
Min.	4,200,000	

Station: Leib & Jefferson

Date: March 25-26, 1954

Accumulated Inches of Rain

Time	Coliforms 12/100 ml	Chlorides (ppm)
1904	1,500,000	55
1937	1,500,000	42
2010	2,300,000	43
2043	2,000,000	-
2116	2,200,000	-
2150	1,100,000	36
2222	100,000	-
2255	5,200,000	-
2329	400,000	32
0002	1,800,000	-
0034	1,100,000	-
0108	100,000	35
0141	2,500,000	-
0218	1,400,000	-
Max.	5,200,000	
Med.	1,500,000	
Min.	100,000	



Station: Conners Creek

Date: April 3, 1964

Accumulated Inches of Rain

Time	Coliforms MP/100 ml	Total Fecal/100 ml	Flow (CFS)
0000	1,500,000	600,000	
0014	700,000	200,000	
0047	5,000,000	-	
0117	500,000	150,000	
0223	370,000	148,000	
0249	500,000	150,000	
0320	900,000	270,000	
0350	1,100,000	110,000	
0421	450,000	270,000	
0451	1,500,000	750,000	
0522	340,000	102,000	
0552	500,000	240,000	
0628	200,000	20,000	
0658	500,000	240,000	
0728	600,000	150,000	
0759	400,000		
0830	500,000		
0900	400,000		
0924	500,000	-	
0934	700,000	-	
1007	300,000	-	
1047	300,000	-	
1225	100,000	-	
1326	500,000	-	
1356	500,000	-	
1458	400,000	-	
1558	500,000	-	
1658	400,000	-	
1758	700,000	-	
1859	400,000	-	
2000	400,000	-	
Max.	6,000,000	750,000	
Avg.	500,000	200,000	
Min.	100,000	20,000	

Station: Leib & Jefferson

Date: April 2-3, 1964

Accumulated Inches of Rain

Time	Coliform MP/100 ml	Total Fecal/100 ml
2122	800,000	-
2202	2,100,000	840,000
2239	14,000,000	2,800,000
2318	3,400,000	1,020,000
2356	3,700,000	1,110,000
0034	2,700,000	1,000,000
0113	2,400,000	1,200,000
0151	1,000,000	350,000
0230	2,000,000	400,000
0308	1,500,000	1,280,000
0346	2,500,000	1,500,000
0425	2,300,000	500,000
0504	2,000,000	400,000
0544	1,500,000	450,000
0623	2,700,000	1,350,000
0650 (est.)	2,200,000	1,320,000
0726	2,200,000	650,000
1032	2,000,000	370,000
1150	1,700,000	1,190,000
1308	100,000	-
1428	1,700,000	580,000
1500	100,000	-
1604	1,400,000	420,000
1705	1,700,000	600,000
1808	1,900,000	570,000
1910	1,100,000	440,000
1956	1,200,000	350,000
Max.	14,000,000	2,800,000
Med.	2,000,000	770,000
Min.	100,000	350,000

Precipitation in inches

08

07

06

05

04

03

02

01

5

	TOTAL EQ. FORM MF/100ml	TOTAL FERM Per 100 ml	PO ₄ Super Solids	86ppm
MEDIAN	7,150,000	2,185,000		
MINIMUM	3,100,000	960,000		
MAXIMUM	11,000,000	5,950,000		

Total Overflow 6.9 million ft³

Connant-Mt Elliot overflow
0448-1116

APRIL

6

Station: Leib & Jefferson

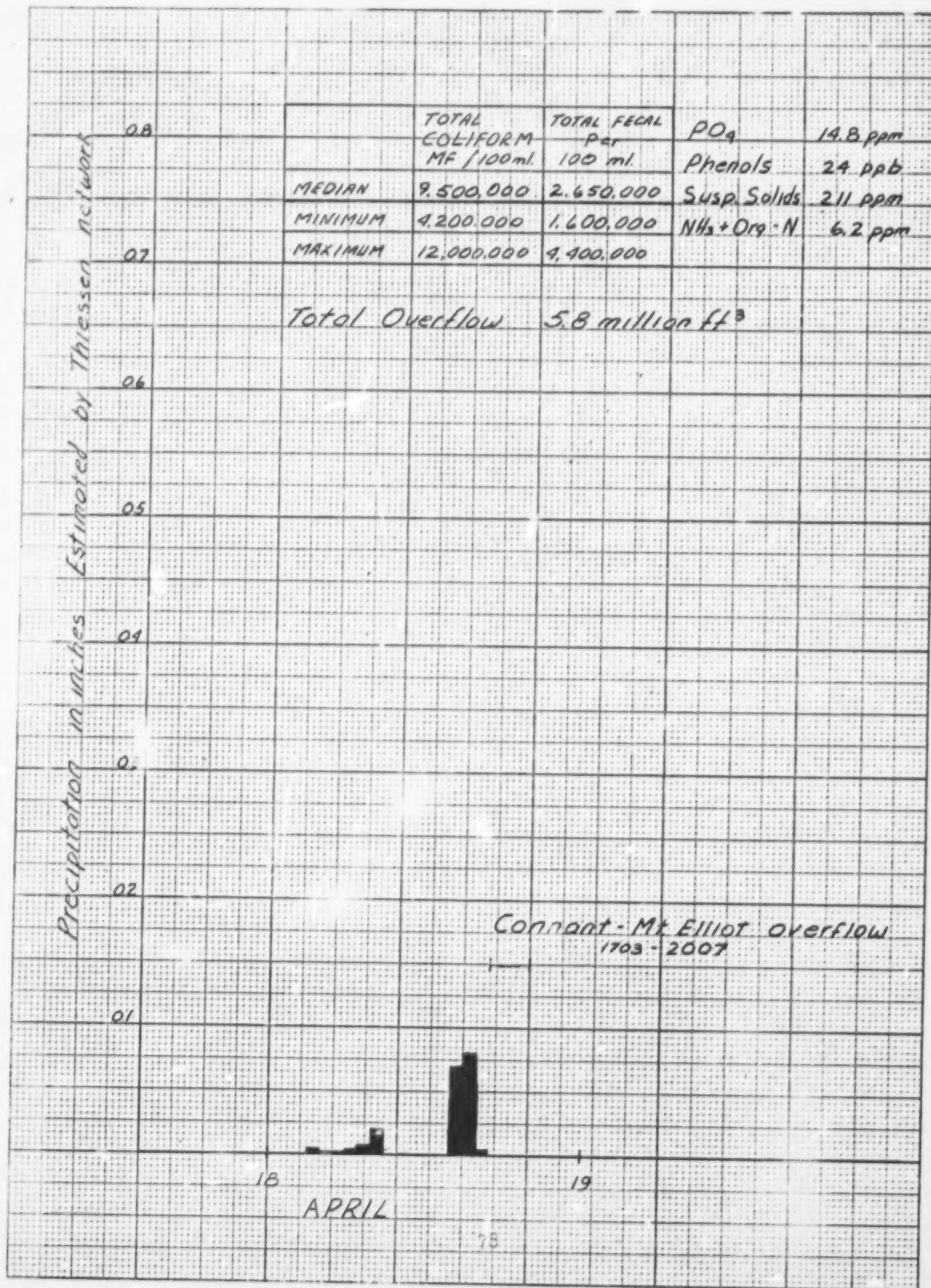
Date: April 6, 1964

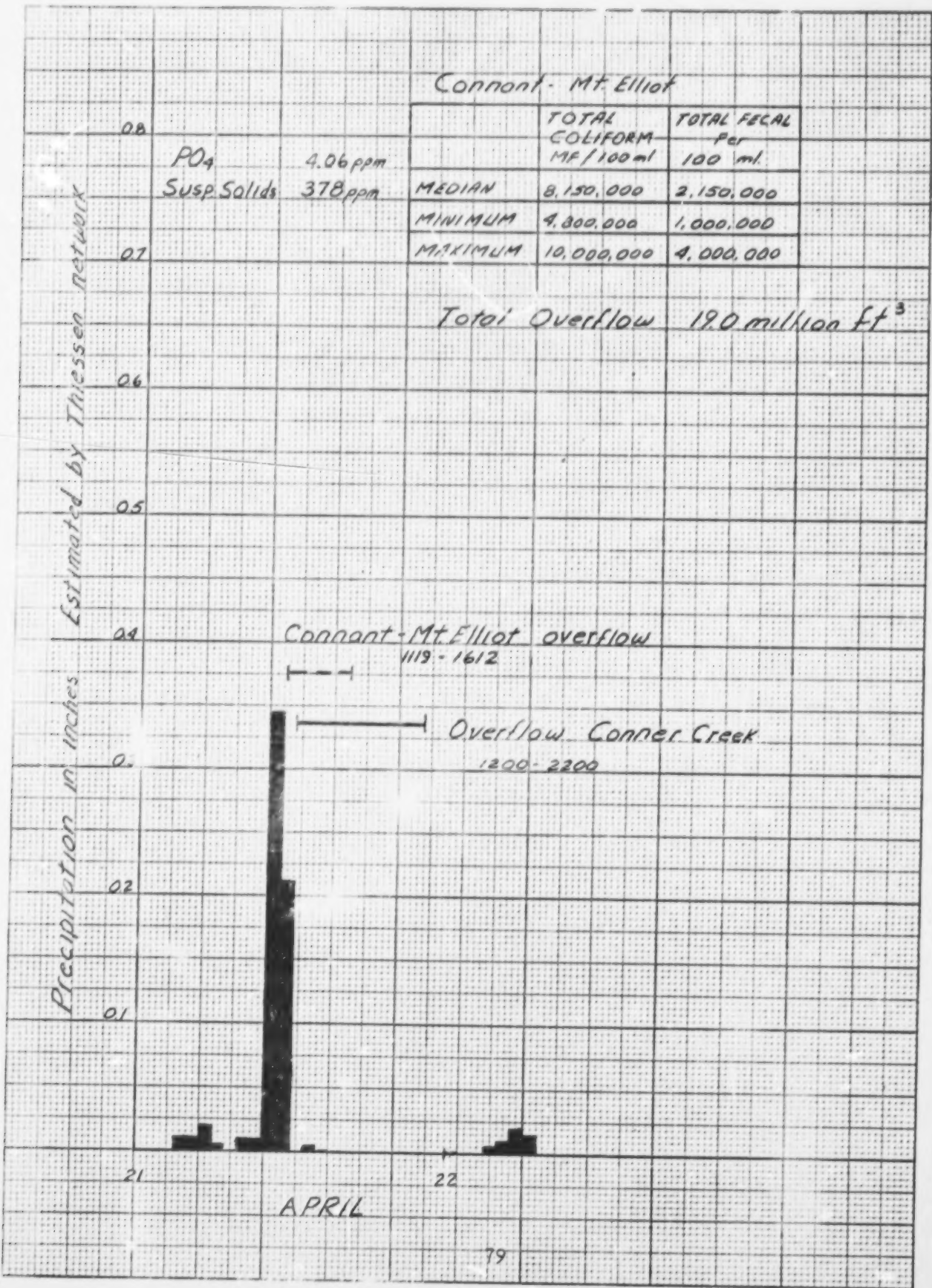
Accumulated Inches of Rain

Time	Coliforms MF/100 ml	Total Fecal/100 ml
0448	8,500,000	5,950,000
0548	11,000,000	2,200,000
0648	5,800,000	4,640,000
0951	10,000,000	2,000,000
1052	3,200,000	960,000
1116	3,100,000	2,170,000
Max.	11,000,000	5,950,000
Med.	7,150,000	2,185,000
Min.	3,100,000	960,000

A composite of the above samples gave the following results:

Phosphates	9.6 ppm
Suspended Solids	86 ppm





Station: Leib & Jefferson

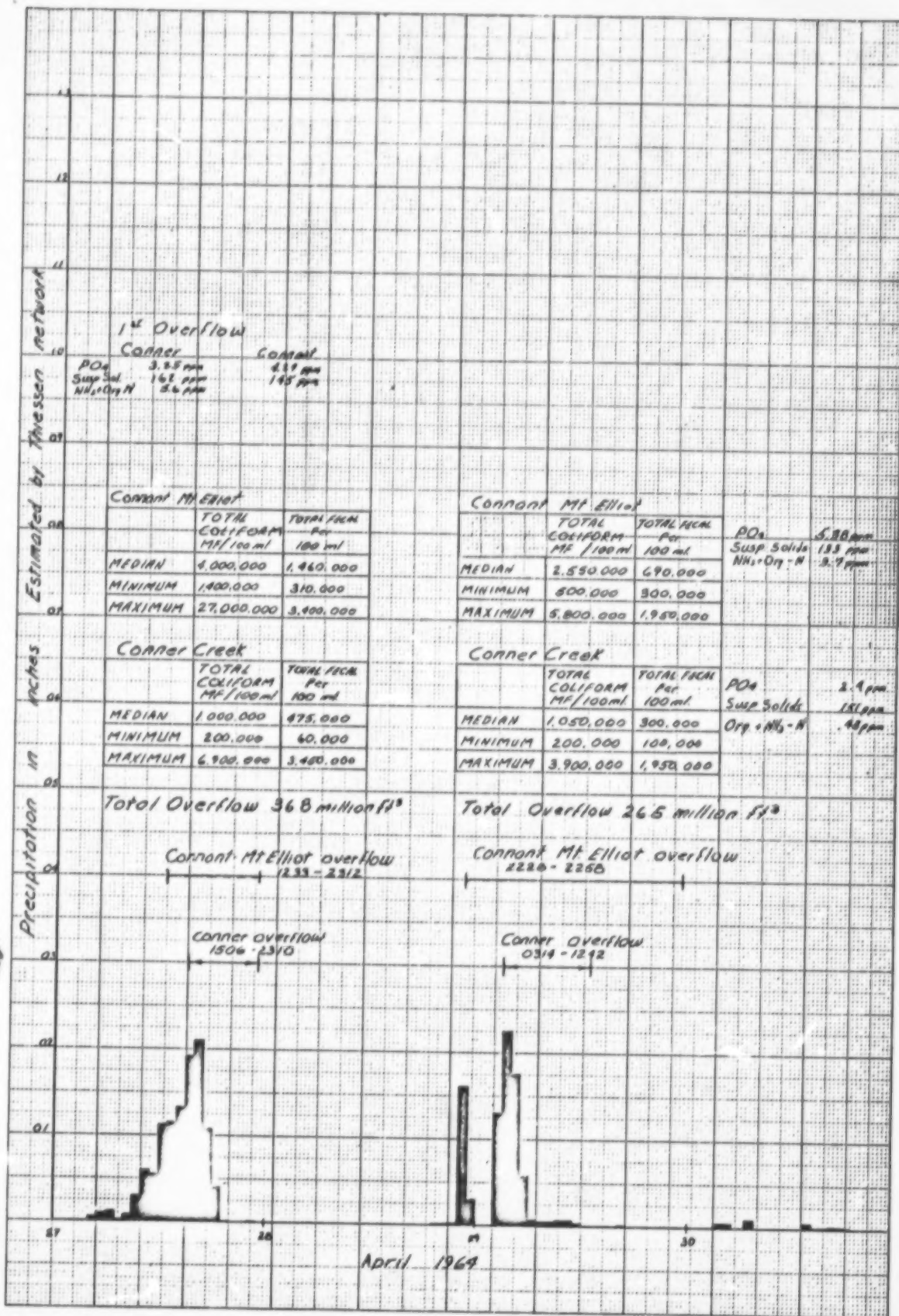
Date: April 18, 1964

Accumulated Inches of Rain

Time	Coliforms MF/100 ml	Total Fecal/100 ml
1703	4,200,000	2,900,000
1804	12,000,000	2,400,000
1906	11,000,000	4,400,000
2007	8,000,000	1,600,000
Max.	12,000,000	4,400,000
Med.	9,500,000	2,650,000
Min.	4,200,000	1,600,000

A composite of all samples gave the following results:

Phosphates	14.8 ppm
Phenols	24 ppb
Suspended Solids	211 ppm
Ammonia Nitrogen	5.9 ppm
Organic Nitrogen	.28 ppm



Station: Leib & Jefferson

Date: April 21, 1964

Accumulated Inches of Rain

Time	Coliforms MF/100 ml	Total Fecal/100 ml
1119	7,900,000	1,600,000
1220	5,200,000	2,600,000
1320	8,400,000	1,700,000
1409	9,400,000	2,800,000
1512	10,000,000	4,000,000
1612	4,800,000	1,000,000
Max.	10,000,000	4,000,000
Med.	8,150,000	2,150,000
Min.	4,800,000	1,000,000

A composite of all samples gave the following results:

Phosphates	4.06 ppm
Suspended Solids	378 ppm

Station: Conners Creek

Date: April 27, 1964

Accumulated Inches of Rain

Time	Coliforms MF/100 ml	Total Fecal/100 ml
1506	3,100,000	1,240,000
1601	6,900,000	3,450,000
1701	-	-
1802	-	-
1901	-	-
2002	-	-
2042	2,500,000	750,000
2116	200,000	60,000
2216	1,000,000	200,000
2250	500,000	-
2310	1,000,000	200,000
Max.	6,900,000	3,450,000
Med.	1,000,000	475,000
Min.	200,000	60,000

A composite of all samples gave the following results:

Phosphate	3.25 ppm
Org. Nitrogen	.52 ppm
Ammonia Nitrogen	5.09 ppm
Suspended Solids	162 ppm
Phenol	68 ppb

Station: Leib & Jefferson

Date: April 27, 1964

Accumulated Inches of Rain

Time	Coliforms MF/100 ml	Total Fecal/100 ml
1233	20,000,000	2,000,000
1336	27,000,000	2,700,000
1436	6,800,000	3,400,000
1538	5,600,000	1,680,000
1640	4,000,000	800,000
1741	1,400,000	420,000
1843	2,000,000	400,000
1944	4,700,000	-
2044	3,100,000	310,000
2146	3,300,000	1,320,000
2312	4,000,000	1,600,000
Max.	27,000,000	3,400,000
Med.	4,000,000	1,460,000
Min.	1,400,000	310,000

A composite of all samples gave the following results:

Phosphates	4.29 ppm
Suspended Solids	145 ppm
Phenol	35 ppb

Station: Conners Creek

Date: April 29, 1964

Accumulated Inches of Rain

Time	Coliforms MF/100 ml	Total Fecal/100 ml
0314	3,300,000	1,650,000
0326	2,900,000	1,160,000
0426	3,900,000	1,950,000
0527	1,900,000	380,000
0627	1,000,000	100,000
0727	600,000	-
0828	500,000	-
0928	200,000	-
1029	200,000	-
1130	2,300,000	230,000
1138	1,100,000	220,000
1242	900,000	180,000
Max.	3,900,000	1,950,000
Med.	1,050,000	300,000
Min.	200,000	100,000

A composite of all samples gave the following results:

Phosphates	2.4 ppm
Organic Nitrogen	.48 ppm
Suspended Solids	151 ppm
Phenol	125 ppb

Station: Leib & Jefferson

Date: April 28-29, 1964

Accumulated Inches of Rain

Time	Coliforms MF/100 ml	Total Fecal/100 ml
2228	4,800,000	1,900,000
2330	3,400,000	1,350,000
0030	4,900,000	1,950,000
0132	5,800,000	1,740,000
0328	3,200,000	960,000
0430	2,300,000	690,000
0530	4,300,000	430,000
0631	3,000,000	300,000
0733	3,200,000	960,000
0834	1,000,000	600,000
0935	1,400,000	560,000
1038	1,700,000	680,000
1140	1,900,000	950,000
1242	1,600,000	1,280,000
1343	600,000	-
1449	500,000	-
1549	4,200,000	840,000
1650	700,000	-
1750	2,300,000	460,000
1852	2,100,000	630,000
1954	2,600,000	620,000
2055	2,500,000	500,000
2156	2,700,000	540,000
2258	3,500,000	1,750,000
Max.	5,800,000	1,950,000
Med.	2,550,000	690,000
Min.	500,000	300,000

A composite of all samples gave the following results:

Phosphates	5.38 ppm
Org. Nitrogen	.27 ppm
Ammonia Nitrogen	3.41 ppm
Suspended Solids	133 ppm
Phenol	30 ppb

PO₄ 1.84 ppm
SUSP. SOL. 49 ppm

Conner Creek

	TOTAL COLIFORMS MF/100 ml	TOTAL FECAL Per 100 ml
MEDIAN	5,800,000	1,700,000
MIN.	1,600,000	570,000
MAX.	16,200,000	3,200,000

Connant Mt. Elliot

	TOTAL COLIFORM MF/100 ml	TOTAL FECAL Per 100 ml
MEDIAN	16,000,000	3,200,000
MIN.	3,900,000	1,500,000
MAX.	38,000,000	11,400,000

Total Overflow 193 million ft³

Precipitation in inches on basin Est. by Thiessen polygons

0.6

0.5

0.4

0.3

0.2

0.1

Overflow Conner Creek
May 8 & 9, 1964 0830-0130

Overflow Connant-Mt. Elliot
May 8, 1964 0710-1215

8

9

May 1964

Station: Leib & Jefferson

Date: May 8, 1964

Accumulated Inches of Rain

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Flow (CFS)
0710	3,900,000	1,500,000	
0812	16,000,000	3,200,000	
0914	38,000,000	11,400,000	
1016	11,200,000	2,200,000	
1118	16,000,000	4,800,000	
Max.	38,000,000	11,400,000	
Med.	16,000,000	3,200,000	
Min.	3,900,000	1,500,000	

Station: Conners Creek

Date: May 8, 1964

Accumulated Inches of Rain

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Flow (CFS)
1009	4,000,000	1,200,000	
1050	16,200,000	1,620,000	
1149	5,800,000	1,160,000	
1245	1,600,000	1,120,000	
1345	3,000,000	1,800,000	
1445	5,300,000	2,120,000	
1521	5,900,000	2,360,000	
1621	6,400,000	3,200,000	
1721	4,000,000	2,000,000	
1821	4,700,000	2,350,000	
1845	6,500,000	1,950,000	
1945	7,000,000	1,400,000	
2045	5,700,000	570,000	
2119	5,700,000	1,700,000	
2143	6,600,000	660,000	
Max.	16,200,000	3,200,000	
Med.	5,800,000	1,700,000	
Min.	1,600,000	570,000	

A composite of all samples gave the following results:

Phosphates	1.84 ppm
Suspended Solids	49 ppm

Precipitation in inches on basin est by Thiessen polygons

Conner Creek

	TOTAL COLIFORM MF/100ml	TOTAL FECAL Per 100 ml
MEDIAN	3,100,000	300,000
MIN.	500,000	100,000
MAX.	45,000,000	2,600,000

Connant - Mt. Elliot

	TOTAL COLIFORM MF/100ml	TOTAL FECAL Per 100 ml
MEDIAN	3,950,000	750,000
MIN.	100,000	100,000
MAX.	29,000,000	2,600,000

Total Overflow 19.3 million ft³

PO₄ 4.2 ppm
Susp Sol. 58 ppm

PO₄ 11.6 ppm
SUSP. SOLIDS 118 ppm
NH₃ + Org. N 6.0 ppm

Overflow
Conner Creek
May 13 & 14, 1964

Overflow Connant Mt. Elliot
May 13 & 14, 1964

May 1964

Station: Leib & Jefferson

Date: May 13-14, 1964

Accumulated Inches of Rain

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Fecal Strep MF/100 ml
0748	28,000,000	-	-
0848	20,000,000	-	-
0950	25,000,000	-	-
1050	29,000,000	1,700,000	600,000
1152	27,000,000	1,500,000	536,000
1254	3,500,000	800,000	427,000
1354	4,400,000	200,000	511,000
1448	6,300,000	500,000	350,000
1548	100,000	100,000	-
1750	2,900,000	1,000,000	369,000
1952	3,200,000	-	290,000
2156	3,100,000	500,000	266,000
2400	1,300,000	200,000	253,000
0204	4,700,000	800,000	362,000
0408	1,200,000	700,000	228,000
0510	700,000	1,300,000	263,000
0612	6,000,000	1,700,000	300,000
0814	24,000,000	2,600,000	240,000
1240	3,000,000	600,000	297,000
1328	1,000,000	600,000	180,000
Max.	29,000,000	2,600,000	
Med.	3,950,000	750,000	
Min.	100,000	100,000	

A composite of all samples gave the following results:

Ammonia Nitrogen	4.95 ppm
Organic Nitrogen	1.09 ppm
Suspended Solids	118 ppm
Phosphates	11.6 ppm

Station: Conners Creek

Date: May 13-14, 1964

Accumulated Inches of Rain

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Fecal Strep MF/100 ml
0824	12,400,000	-	-
1026	1,700,000	-	-
1226	45,000,000	2,600,000	-
1256	6,900,000	900,000	400,000
1321	5,500,000	900,000	400,000
1421	4,500,000	1,100,000	300,000
1520	1,700,000	300,000	400,000
1538	8,300,000	1,200,000	250,000
1628	5,700,000	300,000	240,000
1728	500,000	100,000	72,000
1926	3,800,000	400,000	220,000
2146	-	-	-
2248	5,800,000	500,000	320,000
2420	1,700,000	200,000	360,000
0152	2,400,000	300,000	500,000
0252	600,000	200,000	310,000
0434	1,200,000	100,000	372,000
0541	900,000	300,000	376,000
0658	1,600,000	300,000	9,000
Max.	45,000,000	2,600,000	
Med.	3,100,000	300,000	
Min.	500,000	100,000	

A composite of all samples gave the following results:

Suspended Solids	58 ppm
Phosphates	4.2 ppm

	TOTAL COLIFORM MF/100 ml	FECAL COLIFORM MF/100 ml	FECAL STREP MF/100 ml
MEDIAN	22,000,000	3,200,000	1,570,000
MINIMUM	20,000,000	2,400,000	1,310,000
MAXIMUM	30,000,000	3,200,000	1,620,000

PO₄ 11.2 ppm
Susp Solids 104 ppm

0.5

0.4

0.3

0.2

0.1

16

17

May 1964

Station: Leib & Jefferson

Date: May 16, 1964

Accumulated Inches of Rain

Time	Coliforms MF/100 ml	Total Fecal/100 ml	Fecal Strep MF/100 ml
1200	20,000,000	3,200,000	1,310,000
1302	30,000,000	3,200,000	1,620,000
1404	22,000,000	2,400,000	1,570,000
Max.	30,000,000	3,200,000	1,620,000
Med.	22,000,000	3,200,000	1,570,000
Min.	20,000,000	2,400,000	1,310,000

A composite of all samples gave the following results:

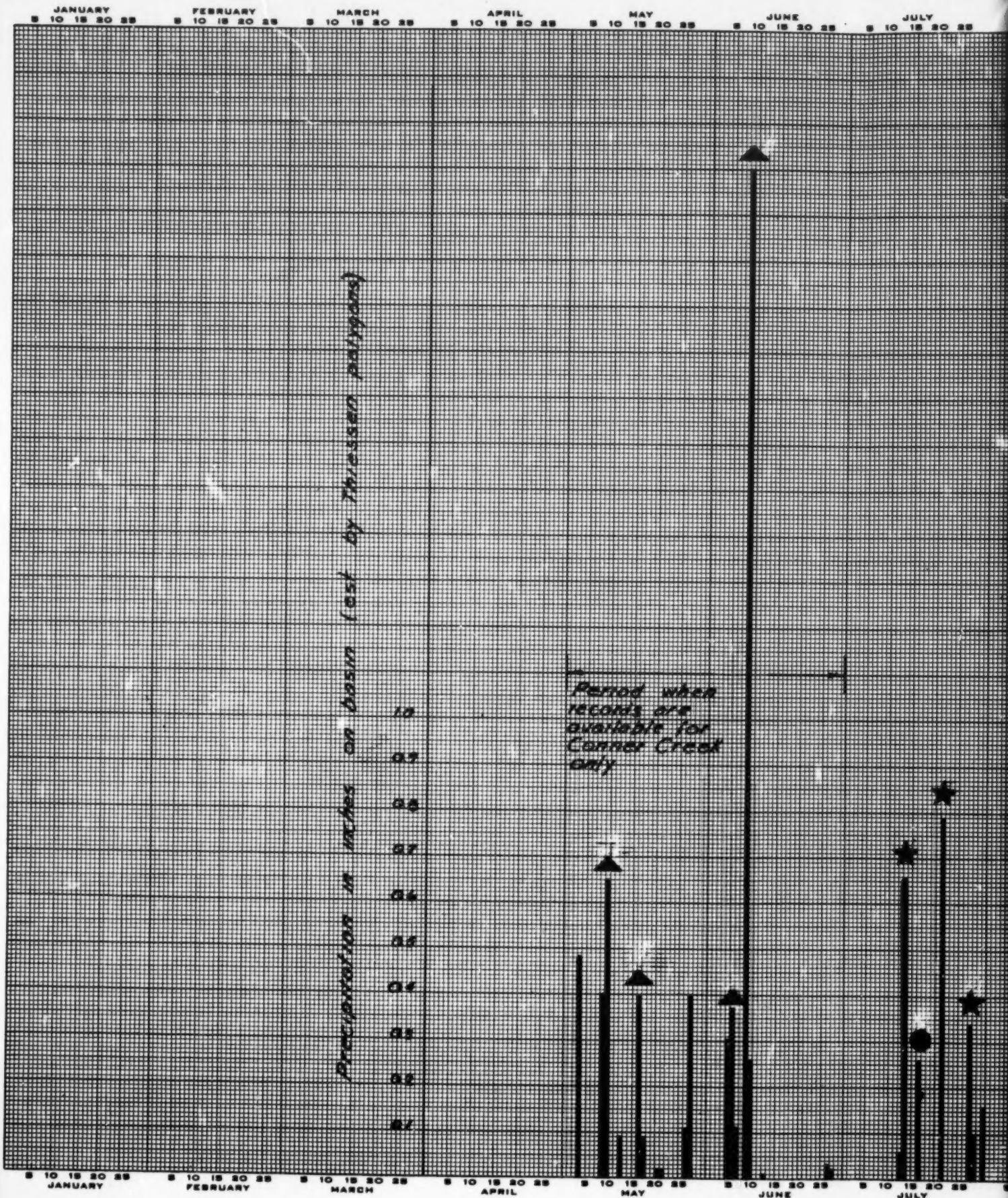
Suspended Solids	104 ppm
Phosphates	11.2 ppm

Median Coliform Values
1963-1964 Study
Sanitary Sewage-Storm Water Overflows
Conner (C), Conant-Mt. Elliott (C-M)
Systems, Detroit, Michigan

<u>STORM</u>		<u>SYSTEM</u>	<u>TOTAL (MPN/100ml)</u>	<u>FECAL (MPN/100ml)</u>
May 10	'63	(C)	2,000,000	-----
May 17-18	'63	(C)	2,700,000	1,480,000
June 6	'63	(C)	7,800,000	4,500,000
June 6-7	'63	(C)	11,100,000	8,800,000
June 9	'63	(C)	3,500,000	1,675,000
June 10	'63	(C)	1,450,000	525,000
July 14	'63	(C)	7,250,000	3,350,000
July 14	'63	(C-M)	35,500,000	8,250,000
July 17-18	'63	(C-M)	37,000,000	12,400,000
July 22	'63	(C-M)	44,000,000	12,400,000
July 22-23	'63	(C)	43,000,000	9,300,000
August 8-9	'63	(C)	23,000,000	16,000,000
August 8-9	'63	(C-M)	12,600,000	12,600,000
August 13-14	'63	(C)	47,500,000	9,400,000
September 12	'63	(C-M)	24,500,000	3,950,000
September 12	'63	(C)	11,500,000	5,500,000
November 1	'63	(C-M)	18,000,000	17,000,000
January 9	'64	(C)	495,000	370,000
January 25	'64	(C)	480,000	-----
Jan-Feb. 31-1	'64	(C)	595,000	-----
March 8-9	'64	(C)	1,200,000	-----
March 25	'64	(C)	2,650,000	-----
March 25	'64	(C-M)	8,600,000	-----
March 25-26	'64	(C-M)	1,500,000	-----
April 2-3	'64	(C-M)	2,000,000	770,000
April 3	'64	(C)	600,000	200,000
April 6	'64	(C-M)	7,150,000	2,185,000
April 18	'64	(C-M)	9,500,000	2,650,000
April 21	'64	(C-M)	8,150,000	2,150,000
April 27	'64	(C-M)	4,000,000	1,460,000
April 27	'64	(C)	1,000,000	475,000
April 28-29	'64	(C-M)	2,550,000	690,000
April 29	'64	(C)	1,050,000	300,000
May 8	'64	(C-M)	16,000,000	3,200,000
May 8-9	'64	(C)	5,800,000	1,700,000
May 13-14	'64	(C-M)	3,950,000	750,000
May 13-14	'64	(C)	3,100,000	300,000
May 16	'64	(C-M)	22,000,000	3,200,000

MEDIAN COLIFORM VALUES
1964 STUDY
STORM WATER DISCHARGE
ALLEN CREEK DRAIN

<u>Storm</u>	<u>Total (MPN/100 ml)</u>	<u>Fecal (MPN/100 ml)</u>
April 2-3	26,500	9,800
April 21	120,000	10,000
April 28	360,000	7,500
May 8	170,000	29,000
June 7	3,200,000	52,000
June 12	3,500,000	69,000
June 15	180,000	26,000
July 2	2,850,000	130,000
July 2	4,300,000	-
July 3	280,000	58,000
July 20	3,750,000	390,000
July 25	17,500,000	1,115,000
August 11	1,450,000	395,000
August 11	250,000	110,000



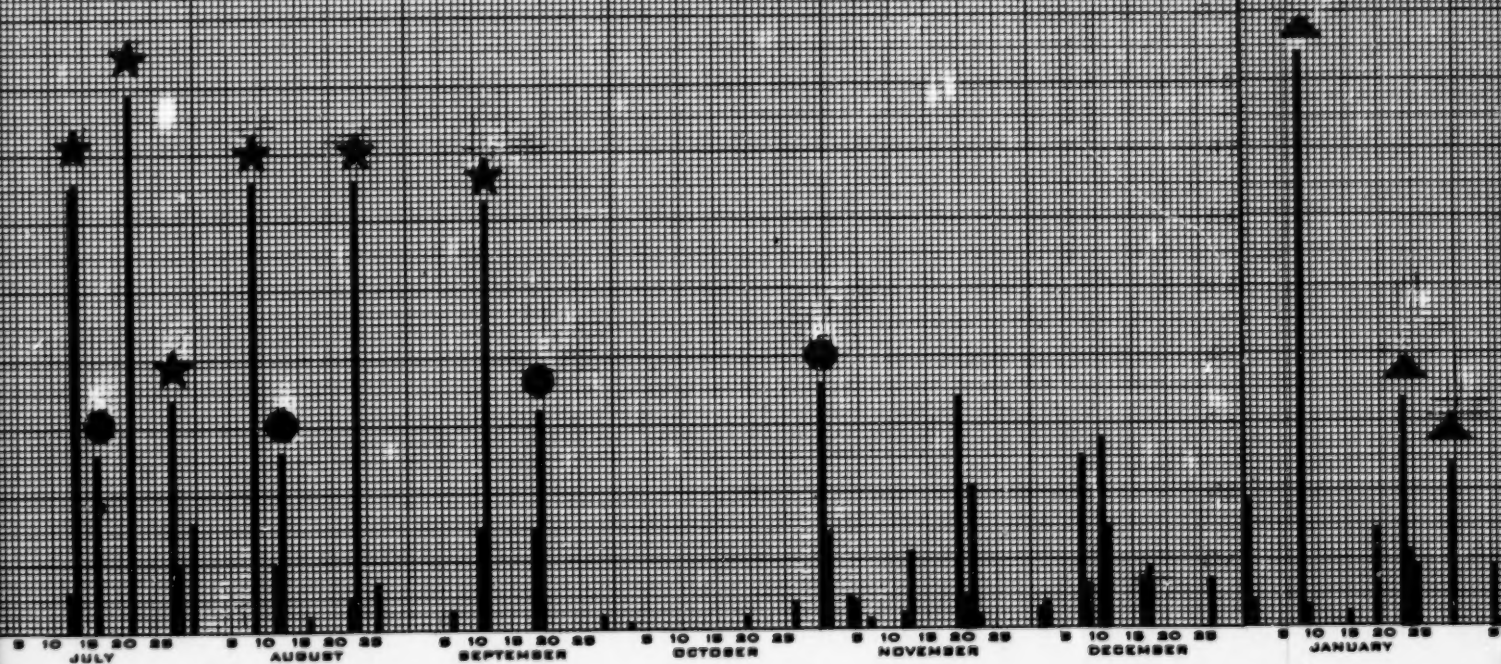
JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER JANUARY FEBRUARY

Daily Precipitation

1965

*Period when automatic
at Conant Mt. Elliot was*

- ★ Overflow from Conner & Conant - Mt. Elliot
- Overflow from Conant - Mt. Elliot
- ▲ Overflow from Conner Creek

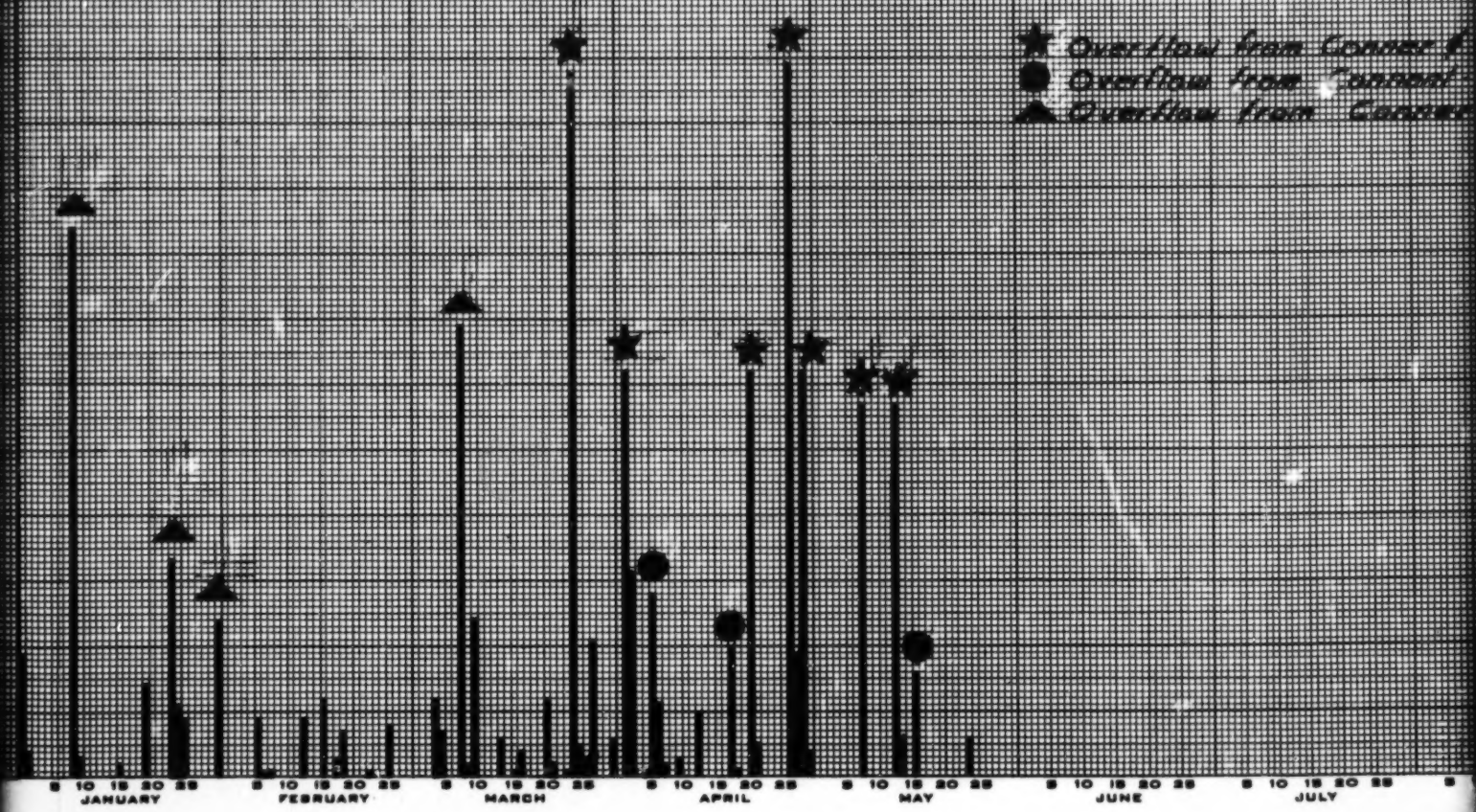


JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY

1964

When automatic sampler
at Ft. Bird was dismantled

- ★ Overflow from Conner
- Overflow from Conner
- ▲ Overflow from Conner



APRIL 10 15 20 25 MAY 5 10 15 20 25 JUNE 5 10 15 20 25 JULY 5 10 15 20 25 AUGUST 5 10 15 20 25 SEPTEMBER 5 10 15 20 25 OCTOBER 5 10 15 20 25

260

- ★ Overflow from Conner & Conant - Mt. Elliot
- Overflow from Conant - Mt. Elliot
- ▲ Overflow from Conner Creek



APRIL 10 15 20 25 MAY 5 10 15 20 25 JUNE 5 10 15 20 25 JULY 5 10 15 20 25 AUGUST 5 10 15 20 25 SEPTEMBER 5 10 15 20 25 OCTOBER 5 10 15 20 25